

Modular SPD for Single Pair RayDat SLH-2 Series D1 • C1 • C2 • C3

SMH-TC Series



IEC/EN Category: D1/C1/C2/C3
Mode of Protection: Longitudinal, Transverse
Coarse Protection: 3 Terminal GDT
Voltages: 5, 12, 15, 24, 30, 48, 60, 110V DC
Frequency Range: 30MHz
Surge Discharge Ratings: I_n : 10kA, I_{max} : 20kA, I_{imp} : 2.5kA
Series Load Current: 1A
Enclosure: DIN 43880 2/3TE, DIN Rail Mount
Terminals: Stranded to 4 mm²
Housing: Modular Design
Compliance: IEC/EN 61643-21

These efficient overvoltage barriers contain both coarse and fine protection stages and provide longitudinal and a transverse surge protection.

The initial protection stage comprises a three-pole gas discharge tube and is designed to divert the primary surge energy. The subsequent fine protection stage is carried out using fast bi-directional silicon avalanche diodes. Care is taken in the design of this fine protection stage to avoid capacitive line loading and thereby ensuring a low insertion loss and wide operating frequency range.

Series line impedances ensure energy coordination between the

coarse and a fine protection stages at all levels of the incident surge. To protect against the hazards of electric shock and fire which often results when power frequency contact occurs between power and communication lines, often called mains incursion, a thermo-clip is included on the primary protection stage to divert the power frequency current to ground.

The plug-in module/base design facilitates replacement of a failed module without the need to remove system wiring.

If the module is unplugged out of the base, the connection lines remain enabled.

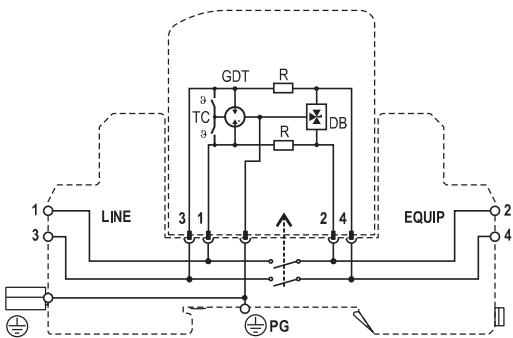
Technical Data

SLH-2 Series		5V	12V	15V	24V	30V	48V	60V	110V
Electrical									
Lines Protected					1 (2 Conductors)				
Nominal Operating Voltage (DC)	U _n	5V	12V	15V	24V	30V	48V	60V	110V
Maximum Continuous Operating Voltage (DC)	U _c	6V	15V	18V	28V	33V	52V	64V	170V
Rated Load Current at 25°C	I _L	1 A							
C2 Nominal Discharge Current (8/20µs)	I _n	10 kA							
Maximum Discharge Current (8/20µs)	I _{max}	20 kA							
D1 Impulse Current (10/350µs)	I _{imp}	2.5 kA							
Residual Voltage at 5kA (8/20µs)	U _{res}	<22V	<42V	<48V	<70V	<80V	<140V	<160V	<450V
Rated Spark Overvoltage	(Line-Ground)	7-10V	16-21V	21-25V	31-37V	36-44V	57-69V	68-84V	184-264V
	(Line-Line)	7-10V	16-21V	21-25V	31-37V	36-44V	57-69V	68-84V	184-264V
Response Time Overvoltage Protection	t _A	< 1 ns							
Thermal Protection		Yes							
Insulation Resistance of the Protection	R _{iso}	≥ 6KΩ	≥ 15MΩ	≥ 18MΩ	≥ 28MΩ	≥ 33MΩ	≥ 52MΩ	≥ 64MΩ	≥ 170MΩ
Serial Resistance per Path	R	1.6-2.0Ω							
Transverse Capacitance	C	50 pF							
Cut-off Frequency	f _G	30 MHz							
Mechanical									
Temperature Range					-40 °C to +80 °C				
Terminal Cross Section Multi-strand					4 mm², 2.5 mm² Q Version				
Terminal Screw Torque					0.5 Nm				
Degree of Protection IEC/EN 60529					IP 20				
Housing Material					Thermoplastic; Grey; Extinguishing Degree V-0				
Mounting IEC/EN 60715					35 mm DIN Rail				
Order Information									
Order Code		5V	12V	15V	24V	30V	48V	60V	110V
SLH-2-xxx		7086,33	7086,34	7086,35	7086,36	7082,80	7086,37	7086,38	7086,39
SLH-2-xxxQ (Quick Connect Terminals)		7085,05	7085,06	7085,07	7085,08	7085,09	7085,10	7085,11	7085,12
SLH-2-xxxM (module)		7086,40	7086,41	7086,42	7086,43	7082,81	7086,44	7086,45	7086,46

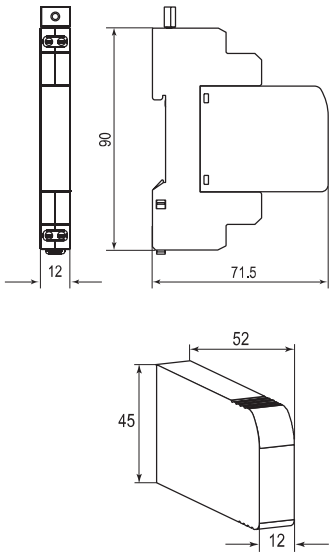
RayDat SLH-2 Series

Internal Configuration

- Legend**
- DB Diode Block
 - GDT Gas Discharge Tube
 - PG Protective Grounding
 - R Resistor
 - TC Thermo-clip



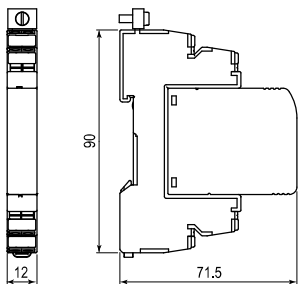
Dimensions & Packaging



SLH-2 Series	5V	12V	15V	24V	30V	48V	60V	110V
Dimensions								
Weight per Unit	52 g							
Dimensions DIN 43880	2/3 TE							
Packaging Dimensions (Single Unit)	87 × 15 × 102 mm							
Minimum Package Quantity	15 pieces							

SLH-2-xxxM Series	5V	12V	15V	24V	30V	48V	60V	110V
Dimensions								
Weight per Unit	24 g							
Packaging Dimensions (Single Unit)	87 × 15 × 102 mm							
Minimum Package Quantity	15 pieces							

Quick Connect Terminals



SLH-2-xxxQ Series	5V	12V	15V	24V	30V	48V	60V	110V
Dimensions								
Weight per Unit	54 g							
Dimensions DIN 43880	2/3 TE							
Packaging Dimensions (Single Unit)	87 × 15 × 102 mm							
Minimum Package Quantity	15 pieces							



Bases with Quick Connect Terminals enable faster installation and have built-in contacts to enhance vibration resistance.

Modular SPD for Two Pair

RayDat SLH-4 Series

D1 • C1 • C2 • C3

SMH2-TC Series



IEC/EN Category: D1/C1/C2/C3
 Mode of Protection: Longitudinal, Transverse
 Coarse Protection: 3 Terminal GDT
 Voltages: 5, 12, 15, 24, 30, 48, 60, 110V DC
 Frequency Range: 30 MHz
 Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA, I_{imp} : 5 kA
 Series Load Current: 1 A
 Enclosure: DIN 43880 2/3 TE, DIN Rail Mount
 Terminals: Stranded to 4 mm²
 Housing: Modular Design
 Compliance: IEC/EN 61643-21

Like the RayDat SLH-2 Series, the SLH-4 provides the same level of protection to two independent circuit pairs. A number of protection voltages are available to ensure the user is able to select the closest clamping voltage to the normal signal operation of the equipment being protected.

The plug-in module/base design facilitates replacement of a failed module without the need to remove system wiring.

If the module is unplugged out of the base, the connection lines remain enabled.

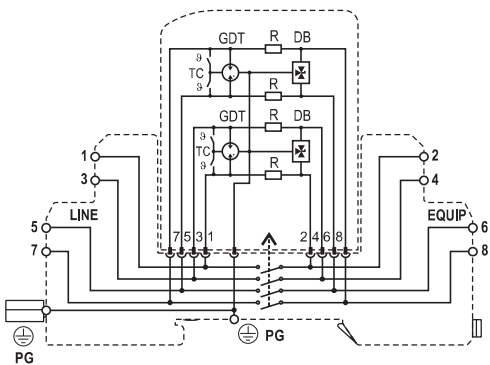
Technical Data

SLH-4 Series		5V	12V	15V	24V	30V	48V	60V	110V
Electrical									
Lines Protected					2 (4 Conductors)				
Nominal Operating Voltage (DC)	U _n	5V	12V	15V	24V	30V	48V	60V	110V
Maximum Continuous Operating Voltage (DC)	U _c	6V	15V	18V	28V	33V	52V	64V	170V
Rated Load Current at 25°C	I _L	1 A							
C2 Nominal Discharge Current (8/20 μs)	I _n	10 kA							
Maximum Discharge Current (8/20 μs)	I _{max}	20 kA							
D1 Impulse Current (10/350 μs)	I _{imp}	5 kA							
Residual Voltage at 5 kA (8/20 μs)	U _{res}	<22V	<42V	<48V	<70V	<80V	<140V	<160V	<450V
Rated Spark Overvoltage	(Line-Ground)	7-10V	17-21V	21-25V	31-37V	36-44V	57-69V	68-84V	184-264V
	(Line-Line)	7-10V	17-21V	21-25V	31-37V	36-44V	57-69V	68-84V	184-264V
Response Time Overvoltage Protection	t _A	< 1 ns							
Thermal Protection		Yes							
Insulation Resistance of the Protection	R _{iso}	≥ 6 KΩ	≥ 15 MΩ	≥ 18 MΩ	≥ 28 MΩ	≥ 33 MΩ	≥ 52 MΩ	≥ 64 MΩ	≥ 170 MΩ
Serial Resistance per Path	R	1.6-2.0 Ω							
Transverse Capacitance	C	50 pF							
Cut-off Frequency	f _G	30 MHz							
Mechanical									
Temperature Range		-40 °C to +80 °C							
Terminal Cross Section Multi-strand		4 mm², 2.5 mm² Q Version							
Terminal Screw Torque		0.5 Nm							
Degree of Protection IEC/EN 60529		IP 20							
Housing Material		Thermoplastic; Grey; Extinguishing Degree V-0							
Mounting IEC/EN 60715		35 mm DIN Rail							
Order Information									
Order Code		5V	12V	15V	24V	30V	48V	60V	110V
SLH-4-xxx		7086.47	7086.48	7086.49	7086.50	7082.78	7086.51	7086.52	7086.53
SLH-4-xxxQ (Quick Connect Terminals)		7085.13	7085.14	7085.15	7085.16	7085.17	7085.18	7085.19	7085.20
SLH-4-xxxM (module)		7086.54	7086.55	7086.56	7086.57	7082.79	7086.58	7086.59	7086.60

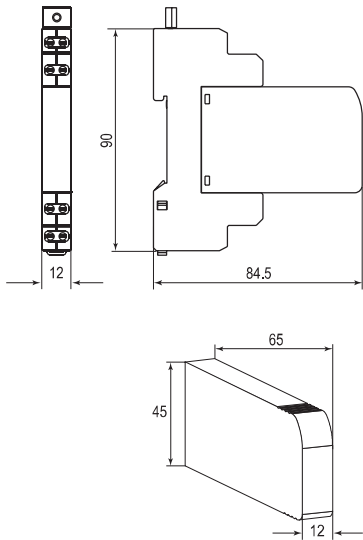
RayDat SLH-4 Series

Internal Configuration

- Legend**
- DB Diode Block
 - GDT Gas Discharge Tube
 - PG Protective Grounding
 - R Resistor
 - TC Thermo-clip



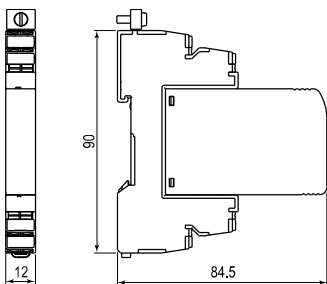
Dimensions & Packaging



SLH-4 Series	5V	12V	15V	24V	30V	48V	60V	110V
Dimensions								
Weight per Unit	66g							
Dimensions DIN 43880	2/3 TE							
Packaging Dimensions (Single Unit)	87 × 15 × 102mm							
Minimum Package Quantity	15 pieces							

SLH-4-xxxM Series	5V	12V	15V	24V	30V	48V	60V	110V
Dimensions								
Weight per Unit	30g							
Packaging Dimensions (Single Unit)	87 × 15 × 102mm							
Minimum Package Quantity	15 pieces							

Quick Connect Terminals



SLH-4-xxxQ Series	5V	12V	15V	24V	30V	48V	60V	110V
Dimensions								
Weight per Unit	66g							
Dimensions DIN 43880	2/3 TE							
Packaging Dimensions (Single Unit)	87 × 15 × 102mm							
Minimum Package Quantity	15 pieces							



Bases with Quick Connect Terminals enable faster installation and have built-in contacts to enhance vibration resistance.