

SPD with Overcurrent Protection
RayDat STD-2 Series
D1 • C1 • C2 • C3



- 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: 0.6 - 10MHz
- Surge Discharge Ratings: I_n : 10kA, I_{max} : 20kA, I_{imp} : 2.5kA
- Series Load Current: 145mA (1A for 110V version)
- Safety: Internal Thermal Runaway Disconnecter
- Indication: 2x End-of-life Status Flag
- Enclosure: DIN 43880 1TE, DIN Rail Mount
- Terminals: Stranded to 6 mm²
- Housing: Modular Design
- Compliance: IEC/EN 61643-21

The RayDAT STD-2 Series of surge protective devices has been developed to protect against the effects of induced voltages onto data, signal and communication circuits.

The circuit used is designed to minimize inter-capacitance, and shunt capacitance, thereby maximizing the operating frequency to 35 MHz in most cases.

The circuit topology consists of a multi-stage protector providing both common (longitudinal) mode and differential (transverse) mode protection.

Coarse protection is provided by a three terminal gas discharge tube while fine protection is provided using a high speed silicon avalanche diodes or metal oxide varistor stage. Care is taken to ensure coordination between these two stages without voltage or surge current blind spots occurring.

Thermal protection is provided to reduce the hazards of thermal runaway should there be an inadvertent mains incursion fault.

Technical Data

STD-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	145mA	145mA	145mA	145mA	145mA	145mA	145mA	1A
C2 Nominal Discharge Current (8/20µs)	I_n	10kA							
Maximum Discharge Current (8/20µs)	I_{max}	20kA							
D1 Impulse Current (10/350µs)	I_{imp}	2.5kA							
Residual Voltage at 5kA (8/20µs)	U_{res}	<20V	<39V	<45V	<65V	<77V	<135V	<150V	<450V
Rated Spark Overvoltage	(Line-Ground)	6.5-9V	16-20V	20-24V	3036V	35-43V	55-68V	67-85V	184-264V
	(Line-Line)	6.5-9V	16-20V	20-24V	3036V	35-43V	55-68V	67-85V	184-264V
Response Time Overvoltage Protection	t_A	<1 ns	<1 ns	<1 ns	<1 ns	<1 ns	<1 ns	<1 ns	<25 ns
Thermal Protection	(a,b)	Thermal Disconnection Lines a & b							
Overcurrent Protection		PTC Resistors at $I \geq 0.3A$							
Insulation Resistance of the Protection	R_{iso}	$\geq 6K\Omega$	$\geq 15M\Omega$	$\geq 18M\Omega$	$\geq 28M\Omega$	$\geq 33M\Omega$	$\geq 52M\Omega$	$\geq 64M\Omega$	$\geq 170M\Omega$
Serial Resistance per Path	R	9-11Ω	9-11Ω	9-11Ω	9-11Ω	9-11Ω	9-11Ω	9-11Ω	cca. 1Ω
Transverse Capacitance	C	7.0nF	4.4nF	3.3nF	2.9nF	2.1nF	1.2nF	1.0nF	90pF
Cut-off Frequency	f_G	0.6MHz	0.9MHz	1.1MHz	1.4MHz	1.8MHz	2.2MHz	3.0MHz	10MHz
Mechanical									
Temperature Range		-40 °C to +80 °C							
Terminal Cross Section Multi-strand		6mm ²							
Terminal Screw Torque		2.0Nm							
Degree of Protection IEC/EN 60529		IP20							
Housing Material		Thermoplastic; Yellow; Extinguishing Degree V-0							
Mounting IEC/EN 60715		35mm DIN Rail							
Remote Contacts Ratings		AC 250V/0.5A, DC 50V/1A							
Order Information									
Order Code		5V	12V	15V	24V	30V	48V	60V	110V
STD-2-xxx		700.060	700.065	700.070	700.075	700.080	700.085	700.090	700.055
STD-2-xxxS (Base S)		700.061	700.066	700.071	700.076	700.081	700.086	700.091	700.056
STD-2-xxxR (Base R)		700.062	700.067	700.072	700.077	700.082	700.087	700.092	700.057
STD-2-xxxG (Base G)		700.063	700.068	700.073	700.078	700.083	700.088	700.093	700.058
STD-2-xxxM (module)		700.059	700.064	700.069	700.074	700.079	700.084	700.089	700.054

STD-2 Series

Base Options

S Base: Where a coaxial shield is used and equipotential ground equalization is required.

R Base: Provides remote contacts to signify if an internal thermal disconnect has operated.

G Base: Where a second ground terminal (in addition to the DIN rail ground strip) is provided for installations not utilizing DIN rail.



STD-2
Base

STD-2
S Base

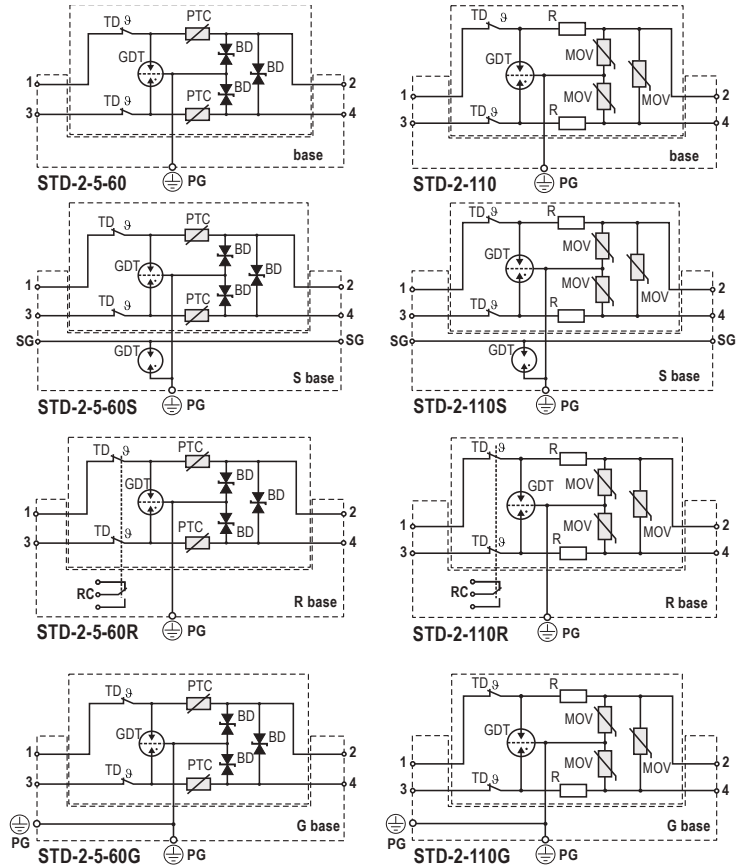
STD-2
R Base

STD-2
G Base

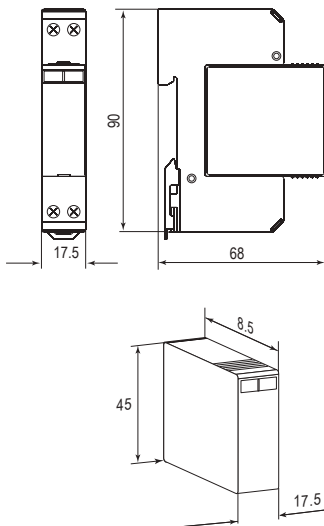
Legend

- BD Bi-directional TVS Diode
- GDT Gas Discharge Tube
- MOV Metal Oxide Varistor
- PG Protective Grounding
- PTC Positive Temperature Coefficient Resistor
- R Resistor
- SG Signal Grounding
- TD Thermal Decoupler

Internal Configuration



Dimensions & Packaging



STD-2 Series	STD-2-xxx	STD-2-xxxS	STD-2-xxxR	STD-2-xxxG
Dimensions				
Weight per Unit	88 g	96 g	92 g	96 g
Dimensions DIN 43880	1 TE			
Packaging Dimensions (Single Unit)	78 × 23 × 108 mm			
Minimum Package Quantity	12 pieces			

STD-2-xxxM Series

Dimensions	
Weight per Unit	32 g
Packaging Dimensions (Single Unit)	61 × 49 × 21 mm
Minimum Package Quantity	24 pieces