

Modular & Compact SPD for Single PairLine

FRD2-XXX

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, 110 V DC
 Frequency Range: 30 MHz
 Surge Discharge Ratings: I_n : 10kA, I_{max} : 20kA, I_{imp} : 2.5kA
 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
 UL 497B 4th Edition

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 fineprotection 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

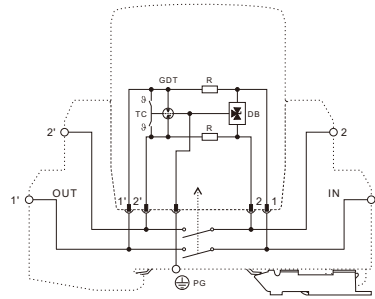
FRD2-XXX		5	12	15	24	30	48	60	110
Electrical									
Lines Protected		1 (2 Conductors)							
Nominal Operating Voltage (DC)	U_n	5 V	12 V	15 V	24 V	30 V	48 V	60 V	110 V
Maximum Continuous Operating Voltage (DC)	U_c	6 V	15 V	18 V	28 V	33 V	52 V	64 V	170 V
Rated Load Current at 25°C	I_L	1 A							
C2 Nominal Discharge Current (8/20 μ s)	I_n	10 kA							
Maximum Discharge Current (8/20 μ s)	I_{max}	20 kA							
D1 Impulse Current (10/350 μ s)	I_{imp}	2.5 kA							
Residual Voltage at 5 kA (8/20 μ s)	U_{res}	< 22 V	< 42 V	< 48 V	< 70 V	< 80 V	< 140 V	< 160 V	< 450 V
Rated Spark Overvoltage	(Line-Ground)	7-10 V	16-21 V	21-25 V	31-37 V	36-44 V	57-69 V	68-84 V	184-264 V
	(Line-Line)	7-10 V	16-21 V	21-25 V	31-37 V	36-44 V	57-69 V	68-84 V	184-264 V
Response Time Overvoltage Protection	t_a	< 1 ns							
Thermal Protection		Yes							
Insulation Resistance of the Protection	R_{so}	≥ 6 k Ω	≥ 15 k Ω	≥ 18 k Ω	≥ 28 k Ω	≥ 33 k Ω	≥ 52 k Ω	≥ 64 k Ω	≥ 170 k Ω
Serial Resistance per Path	R	1.6-2.0 Ω							
Transverse Capacitance	C	50 pF							
Cut-off Frequency	f_c	30 MHz							
Mechanical									
Temperature Range		-40 °F to +176 °F [-40 °C to +80 °C]							
Terminal Cross Section Multi-strand (max.)		12 AWG [4 mm ² , 2.5 mm ² Q Version]							
Terminal Screw Torque		4.5 lbf-in [0.5 Nm]							
Degree of Protection IEC/EN 60529		IP 20 (built-in)							
Housing Material		Thermoplastic; Grey; Extinguishing Degree V-0							
Mounting IEC/EN 60715		35 mm DIN Rail							
Order Information									
Order Code		5	12	15	24	30	48	60	110
FRD2-XXX		0250051	0250121	0250151	0250241	0250301	0250481	0250601	0251101

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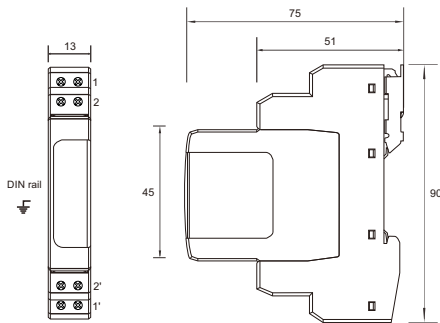
Internal Configuration

Legend

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



Dimensions & Packaging



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FRD2-XXX	5	12	15	24	30	48	60	110
Single Unit DIN 43880 Dimension	1 CTN							
Packaging Dimensions (H x W x L)	[270 x 230 x 330 mm]							
Minimum Order Quantity	72 Units							