

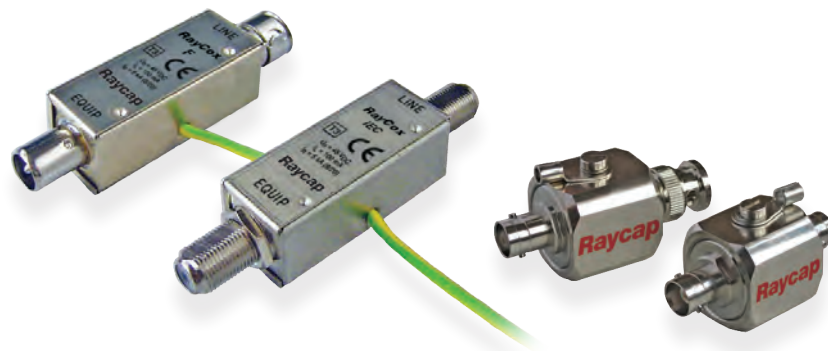
Surge Protective Devices (SPDs) for Coaxial & RF Systems

Coaxial & RF Systems

Special features:

- Very high surge ratings
- Equipped with various types of terminals
- High frequency range (up to 250MHz) suitable for all DSL lines
- Robust metal housing

RayCox BNC
RayCox IEC, F
RayDat CP BNC
RayDat CP 7/16
RayDat CP N
RayDat CP N-6G
RayDat CP TNC-6G
RayDat CP UHF
RayDat CP F75
RayDat CP TV75



Symbol Legend:



Compact Design



Quick Connect Terminals



Plug-In Connection



Shield Directly Grounded

Coaxial protection devices are intended to protect TV sets, aerial amplifiers, CCTV/ CATV systems as well as RF antenna systems. Moreover, they are suitable for frequencies up to 6 GHz.

The careful design, low capacitance gas discharge arresters and high-quality termination connectors ensure a minimum of insertion loss throughout the frequency band.

Surge protection devices are designed to match the requirements for 50 Ohm or 75 Ohm typical impedance. Different types of connectors (BNC, IEC TV, BNC, 7/16, N, TNC UHF and SMA) are used to enable easy installation.

The CP coaxial cable protectors are designed in accordance with IEC 61643-21: 2012 standards and regulations.

Coaxial SPD for Analog Video Surveillance Systems

RayCox BNC Series

C1 • C2 • C3



IEC/EN Category: C1/C2/C3
 Surge Discharge Ratings: I_n : 10kA, I_{max} : 20kA
 Voltages: 10, 24VDC
 Max. Operating Voltage: 12, 24VDC
 Frequency Range: 100MHz
 Series Load Current: 100mA
 Enclosure: In-line Installation
 Termination: BNC Connectors
 Housing: Shielded Enclosure
 Compliance: IEC/EN 61643-21



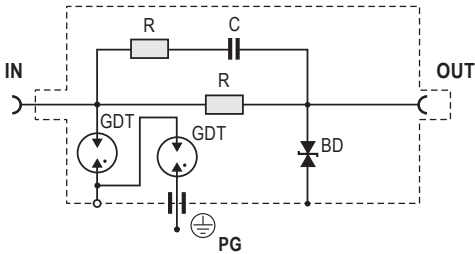
Technical Data

BNC		BNC 5		BNC 12	
Electrical					
Nominal Operating Voltage (DC)		U _n	10V	24V	
Maximum Continuous Operating Voltage (DC)		U _c	12V	28V	
Rated Operating Current at 25°C		I _L		100mA	
C2 Nominal Discharge Current (8/20µs)		I _n		10kA	
Maximum Discharge Current (8/20µs)		I _{max}		20kA	
Residual Voltage at 5kA (8/20µs)	(Wire-Shield)	U _{res}	< 35V	< 65V	
Rated Spark Overvoltage	(Wire-Shield)		13.5V – 16.5V	30V – 36V	
	(Shield-Ground)		72V – 108V	72V – 108V	
Response Time Overvoltage Protection	(Wire-Shield)	t _A		< 10ns	
	(Shield-Ground)			< 100ns	
Insulation Resistance of Protection	(Wire-Shield)	R _{iso}	≥ 12MΩ	≥ 28MΩ	
	(Shield-Ground)			≥ 1GΩ	
Serial Resistance per Path		R		9 – 11Ω	
Transverse Capacitance	(Wire-Shield)	C		30pF	
	(Shield-Ground)			1pF	
Cut-off Frequency		f _G		100MHz	
Transmission Rate				16Mbit/s	
Mechanical					
Temperature Range			-40 °F to +176 °F [-40 °C to +80 °C]		
Connection			BNC Connector		
Degree of Protection IEC/EN 60529			IP20 (built-in)		
Housing Material			Metal		
Order Information					
Order Code		BNC 5		BNC 12	
BNC xx		7050.22		7050.13	

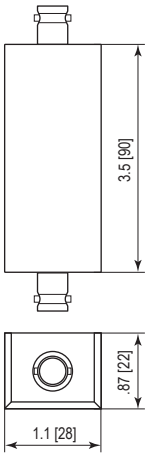
RayCox BNC Series

Internal Configuration

- Legend**
- BD Bi-directional TVS Diode
 - C Capacitor
 - GDT Gas Discharge Tube
 - PG Protective Grounding
 - R Resistor



Dimensions & Packaging

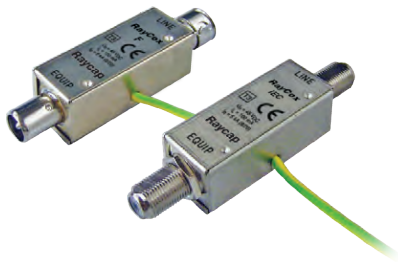


BNC	BNC 5	BNC 12
Dimensions		
Weight per Unit	2.04 oz [58 g]	
Packaging Dimensions (Single Unit)	5.5 × 7.9" [140 × 200 mm]	

inches
[mm]



Coaxial SPD for TV & Cable TV
RayCox IEC 48, F 48
C1 • C2 • C3



IEC/EN Category: C1/C2/C3
Surge Discharge Ratings: I_n : 5 kA
Voltages: 48 VDC
Max. Operating Voltage: 60 VDC
Frequency Range: 40–860 MHz
Series Load Current: 100 mA
Termination: IEC TV or F Connectors
Housing: In-line Installation, Shielded Enclosure
Compliance: IEC/EN 61643-21



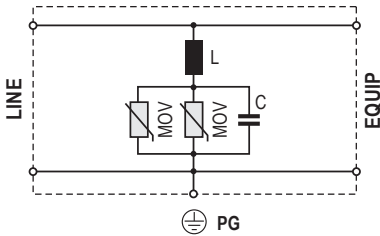
Technical Data

IEC 48		F 48
Electrical		
Nominal Operating Voltage (DC)	U _n	48V
Maximum Continuous Operating Voltage (DC)	U _c	60V
Rated Operating Current at 25°C	I _L	100mA
C2 Nominal Discharge Current (8/20µs)	I _n	5kA
Residual Voltage at 5kA (8/20µs)	U _{res}	<500V
Rated Spark Overvoltage	(Wire-Shield)	90V – 110V
Response Time Overvoltage Protection	(Wire-Shield) t _A	<25ns
Insulation Resistance of Protection	(Wire-Shield) R _{iso}	≥ 6MΩ
Serial Resistance per Path	R	<0.1Ω
Frequency Range	f _G	40–860 MHz
Mechanical		
Temperature Range	-40 °F to +176 °F [-40 °C to +80 °C]	
Connection	TV Connector	F Connector
Degree of Protection IEC/EN 60529	IP 20 (built-in)	
Housing Material	Metal	
Order Information		
Order Code	IEC 48	F 48
XXX 48	125 093	125 094

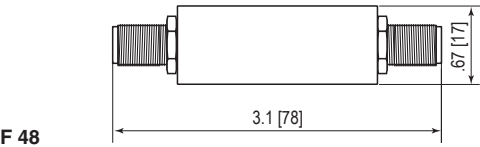
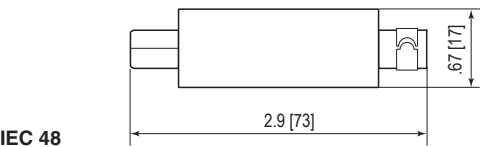
RayCox IEC 48, F 48

Internal Configuration

- Legend
- C Capacitor
 - L Inductor
 - MOV Metal Oxide Varistor
 - PG Protective Grounding



Dimensions & Packaging



	IEC 48	F 48
Dimensions		
Weight per Unit	1.13oz [32g]	
Packaging Dimensions (Single Unit)	3.5 × 5.9" [90 × 150mm]	

inches
[mm]

In-line SPD for Coaxial & RF Systems
RayDat CP BNC Series
C1 • C2 • C3



IEC/EN Category: C1/C2/C3
 Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA
 Max. Operating Voltage: 70, 180, 280 V
 Maximum Peak Power: 40, 125, 300 W
 Frequency Range: DC–2.6 GHz
 Impedance: 50 Ω
 Insertion Loss: < 0.4 dB
 Return Loss: > 20 dB
 Termination: BNC Type (F-F, M-F)
 Housing: In-line Installation, Shielded Enclosure
 Compliance: IEC/EN 61643-21



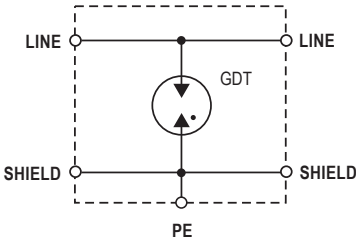
Technical Data

CP BNC		70	180	280
Electrical				
Maximum Continuous Operating Voltage	U _c	70 V	180 V	280 V
Maximum Peak Power	P _{max}	40 W	125 W	300 W
C2 Nominal Discharge Current (8/20 μs)	I _n		10 kA	
Maximum Discharge Current (8/20 μs)	I _{max}		20 kA	
Residual Voltage at (1 kV/μs)	U _{res}	< 600 V	< 700 V	< 900 V
Impedance	Z		50 Ω	
Insertion Loss	I _L		< 0.4 dB	
Return Loss	R _L		> 20 dB	
Insulation Resistance of Protection	R _{iso}		> 10 GΩ	
Frequency Range	f _G		0–2.6 GHz	
Mechanical				
Temperature Range		-40 °F to +176 °F [-40 °C to +80 °C]		
Connection		BNC Female/Female		BNC Male/Female
Degree of Protection IEC/EN 60529		IP 20 (built-in)		
Housing Material		Metal		
Order Information				
Order Code		70	180	280
CP BNC-FF-xxx		800 850	800 851	800 852
CP BNC-MF-xxx		800 853	800 854	800 855

RayDat CP BNC Series

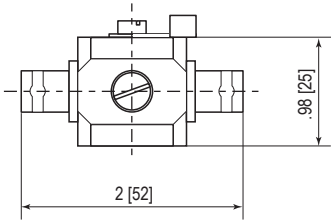
Internal Configuration

Legend
GDT Gas Discharge Tube
PE Ground

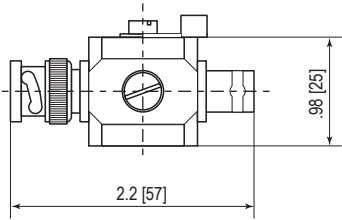


Dimensions & Packaging

CP BNC-FF



CP BNC-MF



CP BNC	CP BNC-FF-xxx			CP BNC-MF-xxx		
	70	180	280	70	180	280
Dimensions						
Weight per Unit	3.74 oz [106g]			4.02 oz [114g]		
Packaging Dimensions (Single Unit)	2.9 × 1.2 × 1.2" [73 × 30 × 30mm]					
Minimum Package Quantity	100 pieces					

inches
[mm]



In-line SPD for Coaxial & RF Systems

RayDat CP 7/16 Series

C1 • C2 • C3

CCP-7/16 Series



IEC/EN Category: C1/C2/C3
 Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA
 Max. Operating Voltage: 70, 180, 280 V
 Maximum Peak Power: 40, 125, 300 W
 Frequency Range: DC–2.5 GHz
 Impedance: 50 Ω
 Insertion Loss: < 0.2 dB
 Return Loss: > 20 dB
 Termination: 7/16 Type (M-F)
 Housing: Bulkhead Installation,
 Shielded Enclosure
 Compliance: IEC/EN 61643-21



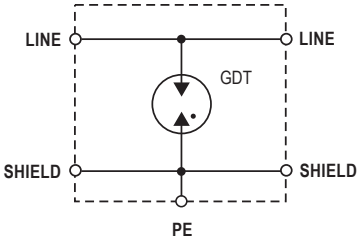
Technical Data

CP 7/16-MF		70	180	280
Electrical				
Maximum Continuous Operating Voltage	U _c	70V	180V	280V
Maximum Peak Power	P _{max}	40W	125W	300W
C2 Nominal Discharge Current (8/20 μs)	I _n		10 kA	
Maximum Discharge Current (8/20 μs)	I _{max}		20 kA	
Residual Voltage at (1 kV/μs)	U _{res}	<600V	<700V	<900V
Impedance	Z		50 Ω	
Insertion Loss	I _L		<0.2 dB	
Return Loss	R _L		>20 dB	
Insulation Resistance of Protection	R _{iso}		>10 GΩ	
Frequency Range	f _G		0–2.5 GHz	
Mechanical				
Temperature Range		-40 °F to +176 °F [-40 °C to +80 °C]		
Connection		7/16 Male/Female		
Degree of Protection IEC/EN 60529		IP20 (built-in)		
Housing Material		Metal		
Order Information				
Order Code		70	180	280
CP 7/16-MF-xxx		800 856	800 857	800 858

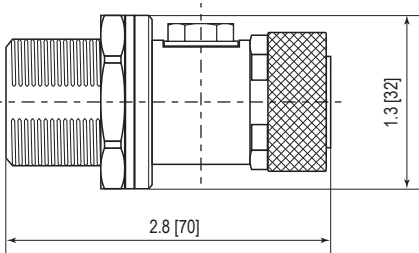
RayDat CP 7/16 Series

Internal Configuration

Legend
GDT Gas Discharge Tube
PE Ground



Dimensions & Packaging



CP 7/16-MF	70	180	280
Dimensions			
Weight per Unit	7.7 oz [218 g]		
Packaging Dimensions (Single Unit)	3.2 × 1.6 × 1.6" [82 × 40 × 40 mm]		
Minimum Package Quantity	100 pieces		

inches
[mm]

In-line SPD for Coaxial & RF Systems

RayDat CP N Series

C1 • C2 • C3



IEC/EN Category: C1/C2/C3
 Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA
 Max. Operating Voltage: 70, 180, 280 V
 Maximum Peak Power: 40, 125, 300 W
 Frequency Range: DC–2.6 GHz
 Impedance: 50 Ω
 Insertion Loss: < 0.4 dB
 Return Loss: > 20 dB
 Termination: N Type (F-F, M-F)
 Housing: In-line Installation, Shielded Enclosure
 Compliance: IEC/EN 61643-21



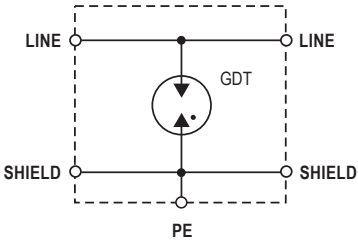
Technical Data

CP-N		70	180	280
Electrical				
Maximum Continuous Operating Voltage	U _c	70V	180V	280V
Maximum Peak Power	P _{max}	40W	125W	300W
C2 Nominal Discharge Current (8/20 μs)	I _n	10kA		
Maximum Discharge Current (8/20 μs)	I _{max}		20kA	
Residual Voltage at (1 kV/μs)	U _{res}	<600V	<700V	<900V
Impedance	Z		50 Ω	
Insertion Loss	I _L		<0.4 dB	
Return Loss	R _L		>20 dB	
Insulation Resistance of Protection	R _{iso}		>10 GΩ	
Frequency Range	f _G		0–2.6 GHz	
Mechanical				
Temperature Range		-40 °F to +176 °F [-40 °C to +80 °C]		
Connection		N Female/Female		N Male/Female
Degree of Protection IEC/EN 60529		IP 20 (built-in)		
Housing Material		Metal		
Order Information				
Order Code		70	180	280
CP N-FF-xxx		800 859	800 860	800 861
CP N-MF-xxx		800 862	800 863	800 864

RayDat CP N Series

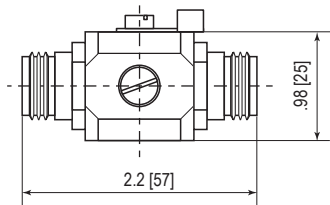
Internal Configuration

Legend
GDT Gas Discharge Tube
PE Ground

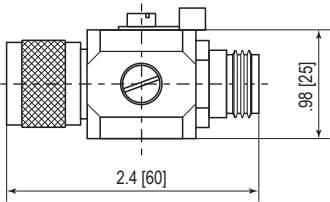


Dimensions & Packaging

CP N-FF



CP N-MF



CP N	CP N-FF-xxx			CP N-MF-xxx		
	70	180	280	70	180	280
Dimensions						
Weight per Unit	4.87 oz [138g]			5.01 oz [142g]		
Packaging Dimensions (Single Unit)	2.9 × 1.2 × 1.2" [73 × 30 × 30mm]					
Minimum Package Quantity	100 pieces					

inches
[mm]



In-line SPD for High Frequency Coaxial & RF Systems
RayDat CP N-6G Series
C1 • C2 • C3



IEC/EN Category: C1/C2/C3
Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA
Max. Operating Voltage: 180 V
Maximum Peak Power: 125 W
Frequency Range: DC–6.0 GHz
Impedance: 50 Ω
Insertion Loss: < 0.4 dB
Return Loss: > 20 dB
Termination: N Type (F-F, M-F)
Housing: Bulkhead Installation,
Shielded Enclosure
Compliance: IEC/EN 61643-21



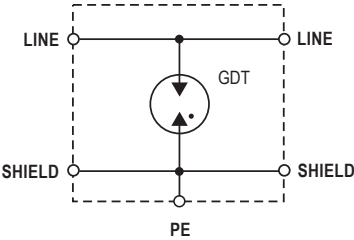
Technical Data

CP N-6G	CP N-6G-FF	CP N-6G-MF
Electrical		
Maximum Continuous Operating Voltage	U _c	180V
Maximum Peak Power	P _{max}	125W
C2 Nominal Discharge Current (8/20μs)	I _n	10 kA
Maximum Discharge Current (8/20μs)	I _{max}	20 kA
Residual Voltage at (1 kV/μs)	U _{res}	< 700V
Impedance	Z	50 Ω
Insertion Loss	I _L	< 0.4 dB
Return Loss	R _L	> 20 dB
Insulation Resistance of Protection	R _{iso}	> 10 GΩ
Frequency Range	f _G	0–6.0 GHz
Mechanical		
Temperature Range	-40 °F to +176 °F [-40 °C to +80 °C]	
Connection	N Female/Female	N Male/Female
Degree of Protection IEC/EN 60529	IP 20 (built-in)	
Housing Material	Metal	
Order Information		
Order Code		
CP N-6G-XX	800 865	800 866

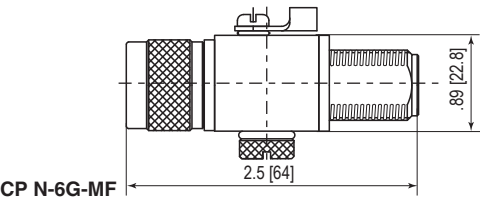
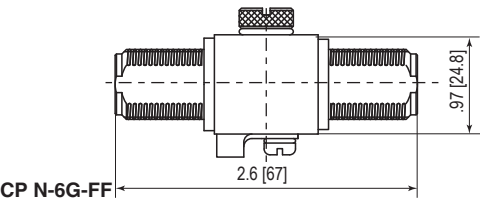
RayDat CP N-6G Series

Internal Configuration

Legend
GDT Gas Discharge Tube
PE Ground



Dimensions & Packaging



CP N-6G	CP N-6G-FF	CP N-6G-MF
Dimensions		
Weight per Unit	4.65 oz [132 g]	4.58 oz [130 g]
Packaging Dimensions (Single Unit)	2.9 × 1.2 × 1.2" [73 × 30 × 30 mm]	
Minimum Package Quantity	100 pieces	

inches
[mm]

In-line SPD for High Frequency Coaxial & RF Systems
RayDat CP TNC-6G Series
C1 • C2 • C3



IEC/EN Category: C1/C2/C3
Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA
Max. Operating Voltage: 180 V
Maximum Peak Power: 125 W
Frequency Range: DC–6.0 GHz
Impedance: 50 Ω
Insertion Loss: < 0.4 dB
Return Loss: > 20 dB
Termination: TNC Type (F-F, M-F)
Housing: In-line Installation, Shielded Enclosure
Compliance: IEC/EN 61643-21



Technical Data

CP TNC-6G

CP TNC-6G-FF

CP TNC-6G-MF

Electrical

Maximum Continuous Operating Voltage	U_c	180 V
Maximum Peak Power	P_{max}	125 W
C2 Nominal Discharge Current (8/20 μ s)	I_n	10 kA
Maximum Discharge Current (8/20 μ s)	I_{max}	20 kA
Residual Voltage at (1 kV/ μ s)	U_{res}	< 700 V
Impedance	Z	50 Ω
Insertion Loss	I_L	< 0.4 dB
Return Loss	R_L	> 20 dB
Insulation Resistance of Protection	R_{iso}	> 10 G Ω
Frequency Range	f_G	0–6.0 GHz

Mechanical

Temperature Range	-40 °F to +176 °F [-40 °C to +80 °C]	
Connection	TNC Female/Female	TNC Male/Female
Degree of Protection IEC/EN 60529	IP 20 (built-in)	
Housing Material	Metal	

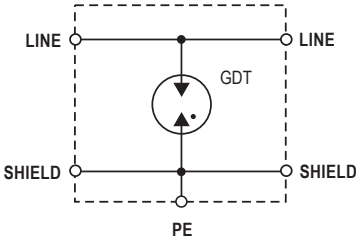
Order Information

Order Code		
CP TNC-6G-XX	800 867	800 868

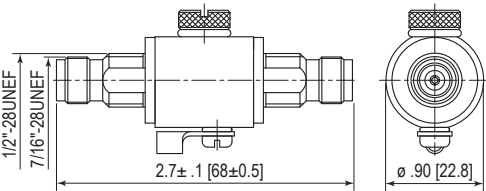
RayDat CP TNC-6G Series

Internal Configuration

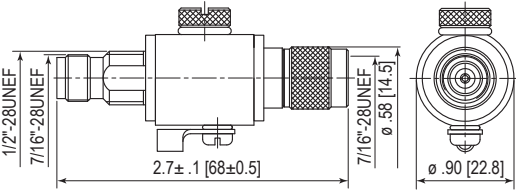
Legend
GDT Gas Discharge Tube
PE Ground



Dimensions & Packaging



CP TNC-6G-FF



CP TNC-6G-MF

CP TNC-6G	CP TNC-6G-FF	CP TNC-6G-MF
Dimensions		
Weight per Unit	4.6 oz [130 g]	4.51 oz [128 g]
Packaging Dimensions (Single Unit)	2.9 × 1.2 × 1.2" [73 × 30 × 30 mm]	
Minimum Package Quantity	100 pieces	

inches
[mm]

In-line SPD for Coaxial & RF Systems

RayDat CP UHF Series

C1 • C2 • C3



IEC/EN Category: C1/C2/C3
 Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA
 Max. Operating Voltage: 70, 180, 280 V
 Maximum Peak Power: 40, 125, 300 W
 Frequency Range: DC–600 MHz
 Impedance: 50 Ω
 Insertion Loss: < 0.4 dB
 Return Loss: > 20 dB
 Termination: UHF Type (F-F, M-F)
 Housing: In-line Installation, Shielded Enclosure
 Compliance: IEC/EN 61643-21



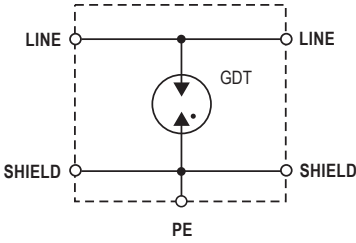
Technical Data

CP UHF		70	180	280
Electrical				
Maximum Continuous Operating Voltage	U _c	70V	180V	280V
Maximum Peak Power	P _{max}	40W	125W	300W
C2 Nominal Discharge Current (8/20 μs)	I _n		10 kA	
Maximum Discharge Current (8/20 μs)	I _{max}		20 kA	
Residual Voltage at (1 kV/μs)	U _{res}	<600V	<700V	<900V
Impedance	Z		50 Ω	
Insertion Loss	I _L		<0.4 dB	
Return Loss	R _L		>20 dB	
Insulation Resistance of Protection	R _{iso}		>10 GΩ	
Frequency Range	f _G		0–600 MHz	
Mechanical				
Temperature Range		-40 °F to +176 °F [-40 °C to +80 °C]		
Connection		UHF Female/Female	UHF Male/Female	
Degree of Protection IEC/EN 60529		IP 20 (built-in)		
Housing Material		Metal		
Order Information				
Order Code		70	180	280
CP UHF-FF-xxx		800 869	800 870	800 871
CP UHF-MF-xxx		800 872	800 873	800 874

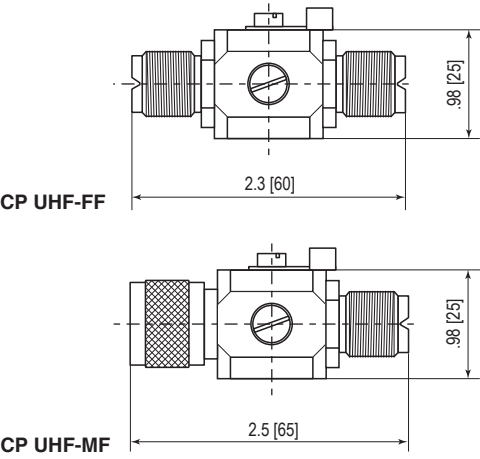
RayDat CP UHF Series

Internal Configuration

Legend
GDT Gas Discharge Tube
PE Ground



Dimensions & Packaging



CP UHF	CP UHF-FF-xxx			CP UHF-MF-xxx		
	70	180	280	70	180	280
Dimensions						
Weight per Unit	3.67 oz [104g]			3.67 oz [104g]		
Packaging Dimensions (Single Unit)	2.4 × 1.2 × 1.4" [62 × 30 × 35mm]					
Minimum Package Quantity	100 pieces					

inches
[mm]



In-line SPD for Coaxial & RF Systems

RayDat CP F75 Series

C1 • C2 • C3



IEC/EN Category: C1/C2/C3
 Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA
 Max. Operating Voltage: 70, 180 V
 Maximum Peak Power: 40, 125 W
 Frequency Range: DC–2.0 GHz
 Impedance: 75 Ω
 Insertion Loss: < 0.4 dB
 Return Loss: > 20 dB
 Termination: F Type (F-F, M-F)
 Housing: In-line Installation, Shielded Enclosure
 Compliance: IEC/EN 61643-21



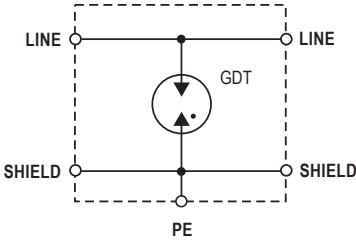
Technical Data

CP F75	70		180
Electrical			
Maximum Continuous Operating Voltage	U _c	70 V	180 V
Maximum Peak Power	P _{max}	40 W	125 W
C2 Nominal Discharge Current (8/20 μs)	I _n	10 kA	
Maximum Discharge Current (8/20 μs)	I _{max}	20 kA	
Residual Voltage at (1 kV/μs)	U _{res}	< 600 V	< 700 V
Impedance	Z	75 Ω	
Insertion Loss	I _L	< 0.4 dB	
Return Loss	R _L	> 20 dB	
Insulation Resistance of Protection	R _{iso}	> 10 GΩ	
Frequency Range	f _G	0–2.0 GHz	
Mechanical			
Temperature Range	-40 °F to +176 °F [-40 °C to +80 °C]		
Connection	F Female/Female		F Male/Female
Degree of Protection IEC/EN 60529	IP 20 (built-in)		
Housing Material	Metal		
Order Information			
Order Code	70		180
CP F75-FF-xxx	800 875		800 876
CP F75-MF-xxx	800 877		800 878

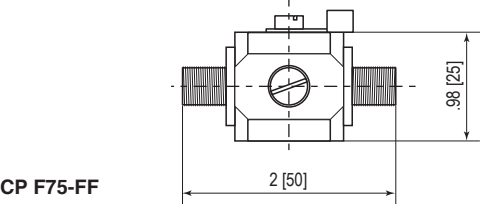
RayDat CP F75 Series

Internal Configuration

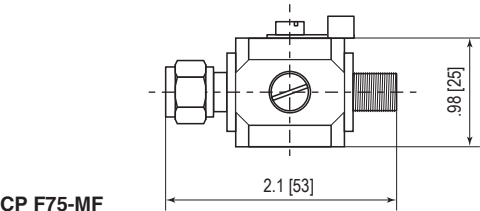
Legend
GDT Gas Discharge Tube
PE Ground



Dimensions & Packaging



CP F75-FF



CP F75-MF

CP F75	CP F75-FF		CP F75-MF	
	70	180	70	180
Dimensions				
Weight per Unit	2.82 oz [80g]		2.96 oz [84g]	
Packaging Dimensions (Single Unit)	2.8 × 1.2 × 1.2" [73 × 30 × 30mm]			
Minimum Package Quantity	100 pieces			

inches
[mm]

In-line SPD for Coaxial & RF Systems
RayDat CP TV75 Series
C1 • C2 • C3



IEC/EN Category: C1/C2/C3
 Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA
 Max. Operating Voltage: 70, 180 V
 Maximum Peak Power: 40, 125 W
 Frequency Range: DC–2.0 GHz
 Impedance: 75 Ω
 Insertion Loss: < 0.4 dB
 Return Loss: > 20 dB
 Termination: TV Type (F-F, M-F)
 Housing: In-line Installation, Shielded Enclosure
 Compliance: IEC/EN 61643-21



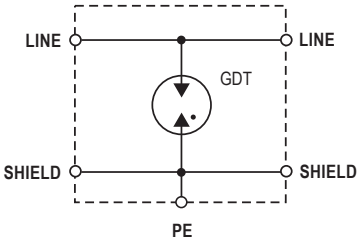
Technical Data

CP TV75		70	180
Electrical			
Maximum Continuous Operating Voltage	U _c	70V	180V
Maximum Peak Power	P _{max}	40W	125W
C2 Nominal Discharge Current (8/20μs)	I _n	10kA	
Maximum Discharge Current (8/20μs)	I _{max}	20kA	
Residual Voltage at (1 kV/μs)	U _{res}	<600V	<700V
Impedance	Z	75Ω	
Insertion Loss	I _L	<0.4 dB	
Return Loss	R _L	>20 dB	
Insulation Resistance of Protection	R _{iso}	> 10 GΩ	
Frequency Range	f _G	0–2.0 GHz	
Mechanical			
Temperature Range		-40 °F to +176 °F [-40 °C to +80 °C]	
Connection		TV Female/Female	TV Male/Female
Degree of Protection IEC/EN 60529		IP 20 (built-in)	
Housing Material		Metal	
Order Information			
Order Code		70	180
CP TV75-FF-xx		800 879	800 880
CP TV75-MF-xx		800 881	800 882

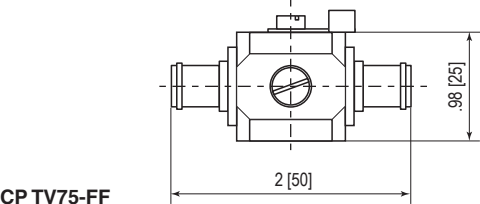
RayDat CP TV75 Series

Internal Configuration

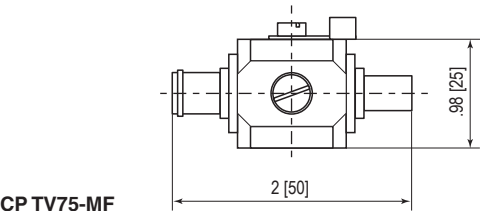
Legend
GDT Gas Discharge Tube
PE Ground



Dimensions & Packaging



CP TV75-FF



CP TV75-MF

CP TV75	CP TV75-FF-xxx		CP TV75-MF-xxx	
	70	180	70	180
Dimensions				
Weight per Unit	2.82 oz [80g]		2.89 [82g]	
Packaging Dimensions (Single Unit)	2.8 × 1.2 × 1.2" [73 × 30 × 30mm]			
Minimum Package Quantity	100 pieces			

inches
[mm]

