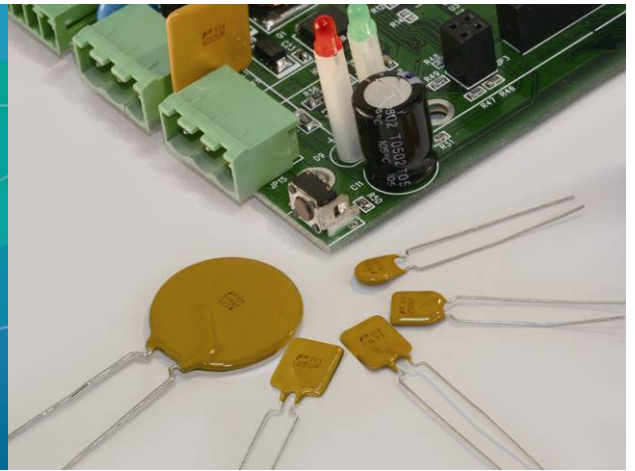


**PRODUCT
DATASHEET**



RLD 30UF Series PTC Devices

RLD 30UF Series PTC Devices

Description

The 30UF series provides radial resettable overcurrent protection with holding current from 0.9A to 9A. This series is suitable for applications with higher holding current and higher working voltage up to 30V.







Features

- RoHS2.0 compliant and lead-free
- Halogen-free
- High voltage
- Low profile
- Fast response to fault current
- Compatible with high temperature solders


Applications

- Power over Ethernet (POE)
- Power supplies
- Motor protection
- IEEE 1394 port protection
- Automotive applications
- Industrial control
- Security systems

Agency Approval and Environmental Compliance

Agency	File Number	Regulation	Standard
	E201431		2011/65/EU
	R50103284.		IEC 61249-2-21:2003

Electrical Characteristics

Part Number	I _{hold} (A)	I _{trip} (A)	V _{max} (Vdc)	I _{max} (A)	P _{d typ} (W)	Maximum Time To Trip		Resistance		Agency Approval	
						Current (A)	Time (Sec.)	R _{min} (Ω)	R _{1max} (Ω)		
RLD30P090UF	0.90	1.80	30	40	0.6	4.50	5.9	0.070	0.220	✓	✓
RLD30P110UF	1.10	2.20	30	40	0.7	5.50	6.6	0.050	0.170	✓	✓
RLD30P135UF	1.35	2.70	30	40	0.8	6.75	7.3	0.040	0.130	✓	✓
RLD30P160UF	1.60	3.20	30	40	0.9	8.00	8.0	0.030	0.110	✓	✓
RLD30P185UF	1.85	3.70	30	40	1.0	9.25	8.7	0.030	0.090	✓	✓
RLD30P250UF	2.50	5.00	30	40	1.2	12.50	10.3	0.020	0.070	✓	✓
RLD30P300UF	3.00	6.00	30	40	2.0	15.00	10.8	0.020	0.080	✓	✓
RLD30P400UF	4.00	8.00	30	40	2.5	20.00	12.7	0.010	0.050	✓	✓
RLD30P500UF	5.00	10.00	30	40	3.0	25.00	14.5	0.010	0.050	✓	✓
RLD30P600UF	6.00	12.00	30	40	3.5	30.00	16.0	0.005	0.040	✓	✓
RLD30P700UF	7.00	14.00	30	40	3.8	35.00	17.5	0.005	0.030	✓	✓
RLD30P800UF	8.00	16.00	30	40	4.0	40.00	18.8	0.005	0.020	✓	✓
RLD30P900UF	9.00	18.00	30	40	4.2	40.00	20.0	0.005	0.020	✓	✓

RLD 30UF Series PTC Devices

Note on Electrical Characteristics

■ Vocabulary

I_{hold} = Hold current: maximum current device will pass without tripping in 23°C still air.

I_{trip} = Trip current: minimum current at which the device will trip in 23 °C still air.

V_{max} = Maximum voltage device can withstand without damage at rated current (I_{max})

I_{max} = Maximum fault current device can withstand without damage at rated voltage (V_{max})

$P_{d\ typ}$ = Power dissipated from device when in the tripped state at 23 °C still air.

R_{min} = Minimum resistance of device in initial (un-soldered) state.

R_{1max} = Maximum resistance of device at 23 °C measured one hour after tripping or reflow soldering of 260 °C for 20 sec.

■ **Caution:** Operation beyond the specified rating may result in damage and possible arcing and flame.

■ Specifications are subject to change without notice.

Polymeric PTC Selecting Guide

■ Determine the following operating parameters for the circuits:

- Normal operating current (I_{hold})
- Maximum circuit voltage (V_{max})
- Maximum interrupt current (I_{max})
- Normal operating temperature surrounding device (min°C/max°C)

■ Select the device form factor and dimension suitable for the application:

- Surface Mount Device (SMD)
- Radial Leaded Device (RLD)
- Axial Leaded Device (ALD)
- DISC Device
- Other Customized Form Factors

■ Compare the maximum rating for V_{max} and I_{max} of the PPTC device with the circuit in application and make sure the circuit's requirement does not exceed the device rating.

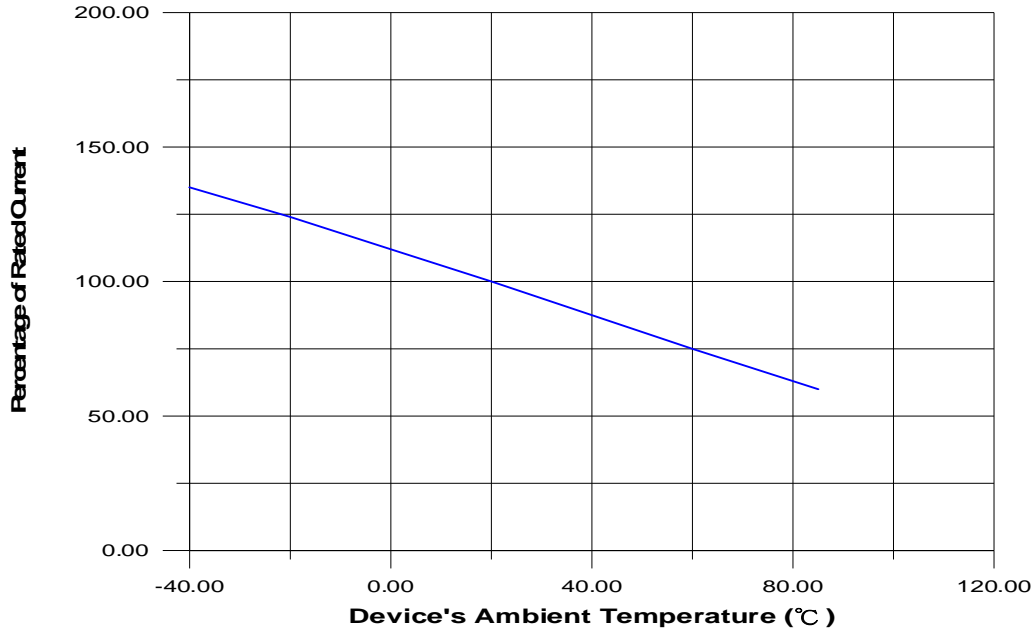
■ Check that PPTC device's trip time (time-to-trip) will protect the circuit.

■ Verify that the circuit operating temperature is within the PPTC device's normal operating temperature range.

■ Verify the performance and suitability of the chosen PPTC device in the application.

RLD 30UF Series PTC Devices

Thermal Derating Curve



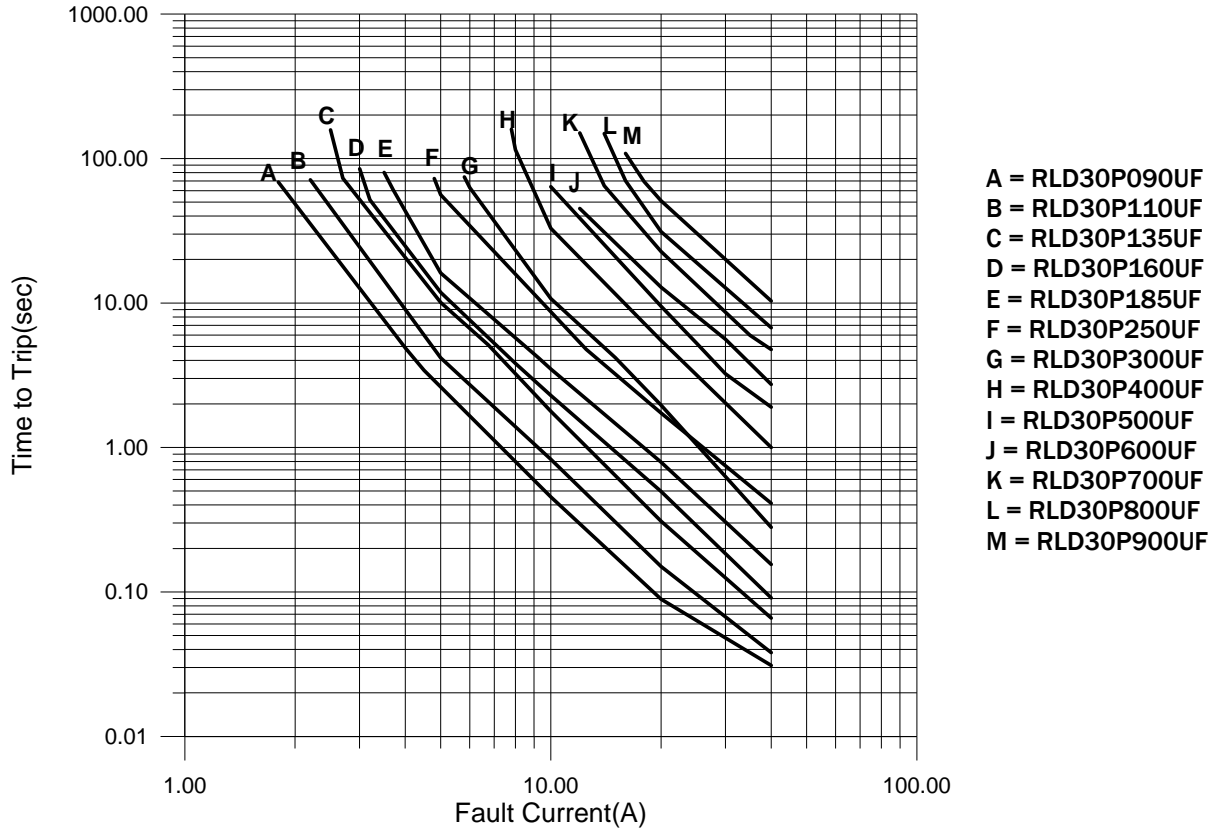
Thermal Derating Chart

Recommended Hold Current (A) at Ambient Temperature (°C)

Part Number	Ambient Operation Temperature								
	-40 °C	-20 °C	0 °C	23 °C	40 °C	50 °C	60 °C	70 °C	85 °C
RLD30P090UF	1.31	1.17	1.04	0.90	0.75	0.69	0.61	0.55	0.47
RLD30P110UF	1.60	1.43	1.27	1.10	0.91	0.85	0.75	0.67	0.57
RLD30P135UF	1.96	1.76	1.55	1.35	1.12	1.04	0.92	0.82	0.70
RLD30P160UF	2.32	2.08	1.84	1.60	1.33	1.23	1.09	0.98	0.83
RLD30P185UF	2.68	2.41	2.13	1.85	1.54	1.42	1.26	1.13	0.96
RLD30P250UF	3.63	3.25	2.88	2.50	2.08	1.93	1.70	1.53	1.30
RLD30P300UF	4.35	3.90	3.45	3.00	2.49	2.31	2.04	1.83	1.56
RLD30P400UF	5.80	5.20	4.60	4.00	3.32	3.08	2.72	2.44	2.08
RLD30P500UF	7.25	6.50	5.75	5.00	4.15	3.85	3.40	3.05	2.60
RLD30P600UF	8.70	7.80	6.90	6.00	4.98	4.62	4.08	3.66	3.12
RLD30P700UF	10.15	9.10	8.05	7.00	5.81	5.39	4.76	4.27	3.64
RLD30P800UF	11.60	10.40	9.20	8.00	6.64	6.16	5.44	4.88	4.16
RLD30P900UF	13.05	11.7	10.35	9.00	7.47	6.93	6.12	5.49	4.68

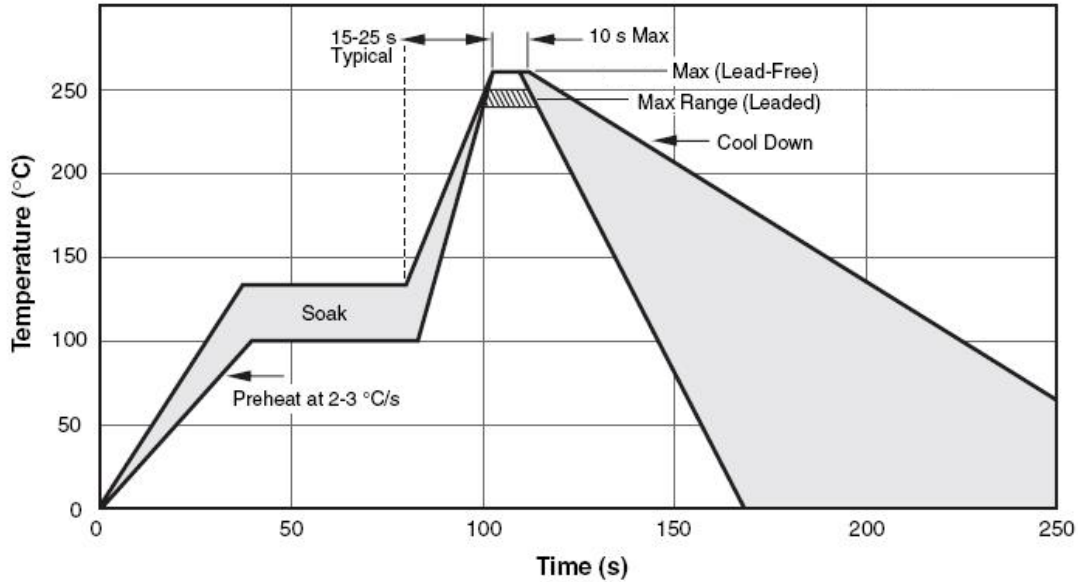
RLD 30UF Series PTC Devices

Average Time-Current Curve



RLD 30UF Series PTC Devices

Wave Soldering Parameters



Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate ($T_{s_{max}}$ to T_P)	4°C/second max.
Preheat	
-Temperature Min ($T_{s_{min}}$)	120°C
-Temperature Max ($T_{s_{max}}$)	150°C
-Time ($T_{s_{min}}$ to $T_{s_{max}}$)	60-180 seconds
Max Peak Temperature (T_P)	265°C
Max Time at Peak Temperature (t_P)	3 - 5 seconds
Ramp-Down Rate	6 °C /second max.
Time 25°C to Peak Temperature	5 minutes max.
Storage Condition	0°C ~35°C, ≤ 80%RH

- Devices can be cleaned using standard industry methods and solvents.

Note 1: All temperature refer to topside of the package, measured on the package body surface.

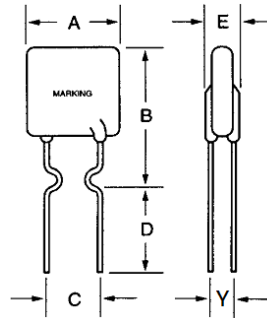
Note 2: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements

Physical Dimensions (mm.)

Lead Material	P090UF-P185UF: Tin-plated copper clad steel P250UF-P900UF: Tin-plated copper
Soldering Characteristics	Solderability per MIL-STD-202, Method 208E
Insulating Material	Cured, flame retardant epoxy polymer meets UL94V-0 requirements.
Device Labeling	Marked with the letter "P", voltage, amperage rating, and lot number.

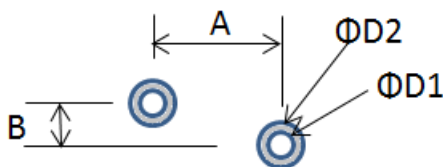
RLD 30UF Series PTC Devices

Physical Dimensions (mm.)



Part Number	A	B	C	D	E	Y	Physical Characteristics	
	(max.)	(max.)	(typ.)	(min.)	(max.)	(typ.)	Lead Size	(max.)
RLD30P090UF	7.4	12.2	5.1±0.7	7.6	3.0	1.0	0.51 dia.	Sn/CuFe
RLD30P110UF	7.4	14.2	5.1±0.7	7.6	3.0	1.0	0.51 dia.	Sn/CuFe
RLD30P135UF	8.9	13.5	5.1±0.7	7.6	3.0	1.0	0.51 dia.	Sn/CuFe
RLD30P160UF	8.9	15.2	5.1±0.7	7.6	3.0	1.0	0.51 dia.	Sn/CuFe
RLD30P185UF	10.2	15.7	5.1±0.7	7.6	3.0	1.0	0.51 dia.	Sn/CuFe
RLD30P250UF	11.4	18.3	5.1±0.7	7.6	3.0	1.0	0.51 dia.	Sn/Cu
RLD30P300UF	11.4	19.2	5.1±0.7	7.6	3.0	1.2	0.81 dia.	Sn/Cu
RLD30P400UF	14.0	22.0	5.1±0.7	7.6	3.0	1.2	0.81 dia.	Sn/Cu
RLD30P500UF	14.0	25.6	10.2±1.0	7.6	3.0	1.2	0.81 dia.	Sn/Cu
RLD30P600UF	16.5	26.8	10.2±1.0	7.6	3.0	1.2	0.81 dia.	Sn/Cu
RLD30P700UF	19.1	28.6	10.2±1.0	7.6	3.0	1.2	0.81 dia.	Sn/Cu
RLD30P800UF	21.6	31.1	10.2±1.0	7.6	3.0	1.2	0.81 dia.	Sn/Cu
RLD30P900UF	24.1	31.6	10.2±1.0	7.6	3.0	1.2	0.81 dia.	Sn/Cu

Solder Layout Recommend (mm)



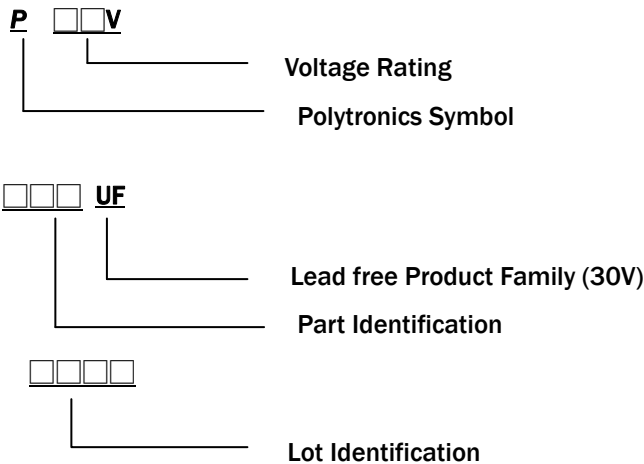
Part Number	A	B	D1	D2
	(typ.)	(typ.)	(typ.)	(typ.)
RLD30P090UF	5.1	1.0	1.0	2.5
RLD30P110UF	5.1	1.0	1.0	2.5
RLD30P135UF	5.1	1.0	1.0	2.5
RLD30P160UF	5.1	1.0	1.0	2.5
RLD30P185UF	5.1	1.0	1.0	2.5
RLD30P250UF	5.1	1.0	1.0	2.5
RLD30P300UF	5.1	1.2	1.5	3.5
RLD30P400UF	5.1	1.2	1.5	3.5
RLD30P500UF	10.2	1.2	1.5	3.5
RLD30P600UF	10.2	1.2	1.5	3.5
RLD30P700UF	10.2	1.2	1.5	3.5
RLD30P800UF	10.2	1.2	1.5	3.5
RLD30P900UF	10.2	1.2	1.5	3.5

RLD 30UF Series PTC Devices

Environmental Specifications

Operating/Storage Temperature	-40°C to +85 °C
Maximum Device Surface Temperature in Tripped State	125°C
Passive Aging	+85°C , 1000 hours ±5% typical resistance change
Humidity Aging	+85°C , 85%R.H. 1000 hours ±5% typical resistance change
Thermal Shock	MIL-STD-202 Method 107G +85°C /-40°C 10 times ±5% typical resistance change
Solvent Resistance	MIL-STD-202, Method 215 No change
Vibration	MIL-STD-883C, Method 2007.1,Condition A No change
Moisture Level Sensitivity	Level 1, J-STD-020C

Part Marking System



RLD 30UF Series PTC Devices

Packaging Quantity and Marking

Product Description	Part I.D.	Bag Quantity	Reelpack Quantity	Ammopack Quantity
RLD30P090UF	090	500	2000	2000
RLD30P110UF	110	500	2000	2000
RLD30P135UF	135	500	2000	2000
RLD30P160UF	160	500	2000	2000
RLD30P185UF	185	500	2000	2000
RLD30P250UF	250	500	2000	2000
RLD30P300UF	300	500	2000	2000
RLD30P400UF	400	200	1000	1000
RLD30P500UF	500	200	1000	1000
RLD30P600UF	600	200	1000	1000
RLD30P700UF	700	200	1000	1000
RLD30P800UF	800	100	N/A	1000
RLD30P900UF	900	100	N/A	1000

RLD 30UF Series PTC Devices

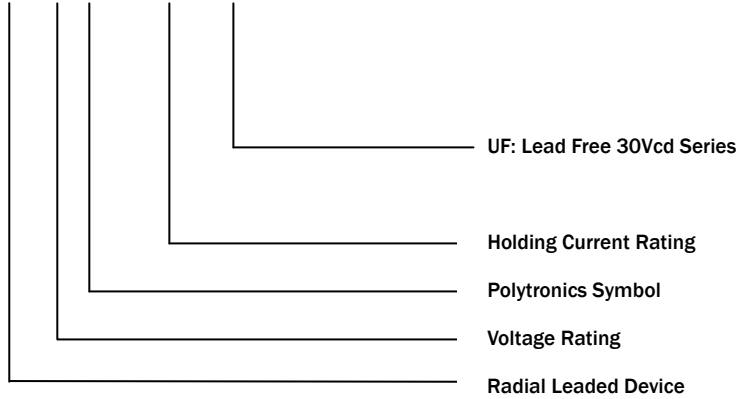
Tape Specifications: EIA468-B/IEC286-2(mm.)

Dimension Description	EIA Mark	IEC Mark	Dimensions	
			Dim.(mm)	Tol.(mm)
Carrier tape width	W	W	18	-0.5/+1.0
Hold down tape width	W ₄	W ₀	11	min.
Top distance between tape edges	W ₆	W ₂	3	max.
Sprocket hole position	W ₅	W ₁	9	-0.5+0.75
Sprocket hole diameter*	D ₀	D ₀	4	-0.32/+0.2
Abscissa to plane(straight lead)	H	H	18.5	+3.0
Abscissa to plane(kinked lead)	H ₀	H ₀	16	+0.5
Abscissa to top P090UF-P185UF	H ₁	H ₁	32.2	max.
Abscissa to top P250UF-P900UF	H ₁		47.5	max.
Overall width w/o lead protrusion P090UF-P185UF	C1		42.5	max.
Overall width w/o lead protrusion P250UF-P900UF			56	max.
Overall width w/ lead protrusion P090UF-P185UF	C2		43.2	max.
Overall width w/ lead protrusion P250UF-P900UF			57	max.
Lead protrusion	L ₁	l ₁	1.0	max.
Protrusion of cut out	L	L	11	max.
Protrusion beyond hold-down tape	l ₂	l ₂	Not specified	
Sprocket hole pitch:P090UF-P300UF	P ₀	P ₀	12.7	+0.3
Sprocket hole pitch on P400UF-P900UF	P ₀	P ₀	25.4	+0.5
Pitch tolerance			20 consecutive.	+1
Device pitch:P090UF-P300UF			12.7	
Device pitch:P400UF-P900UF			25.4	
Tape thickness	t	t	0.9	max.
Tape thickness with splice	t ₁		2.0	max.
Splice sprocket hole alignment			0	+0.3
Body lateral deviation	Δh	Δh	0	+1.0
Body tape plane deviation	Δp	Δp	0	+1.3
Ordinate to adjacent component lead*:P090UF-P300UF	P ₁	P ₁	3.81	+0.7
Ordinate to adjacent component lead*:P400UF-P900UF			7.62	+0.7
Lead spacing:P090UF-P300UF	F	F	5.08	+0.8
Lead spacing:P400UF-P900UF	F	F	10.18	+0.8
Reel width P090UF-P300UF	w ₂	w	56	max.
Reel width P400UF-P900UF	w ₂	w	63.5	max.
Reel diameter	a	d	370	max.
Space between flanges less device*	w ₁		4.75	-3.25/+9.25
Arbor hole diameter	c	f	26	+12.0
Core diameter*	n	h	91	max.
Box			56/372/372	max.
Consecutive missing places			None	
Empty places per reel			0.1%max.	

RLD 30UF Series PTC Devices

Part Number System

RLD 30 P **UF**



Cross Reference

Polytronics / EVERFUSE [®]	Cross Reference	
	Tyco / PolySwitch [®]	Bourns / Multifuse [®]
RLD30P090UF / RLD30P090UF-S	RUEF090 / RUEF090S	MF-R090-0-009
RLD30P110UF / RLD30P110UF-S	RUEF110 / RUEF110S	MF-R110
RLD30P135UF / RLD30P135UF-S	RUEF135 / RUEF135S	MF-R135
RLD30P160UF / RLD30P160UF-S	RUEF160 / RUEF160S	MF-R160
RLD30P185UF / RLD30P185UF-S	RUEF185 / RUEF185S	MF-R185
RLD30P250UF / RLD30P250UF-S	RUEF250 / RUEF250S	MF-R250
RLD30P300UF / RLD30P300UF-S	RUEF300K / RUEF300	MF-R300
RLD30P400UF / RLD30P400UF-S	RUEF400K / RUEF400	MF-R400
RLD30P500UF / RLD30P500UF-S	RUEF500K / RUEF500	MF-R500
RLD30P600UF / RLD30P600UF-S	RUEF600K / RUEF600	MF-R600
RLD30P700UF / RLD30P700UF-S	RUEF700K / RUEF700	MF-R700
RLD30P800UF / RLD30P800UF-S	RUEF800K / RUEF800	MF-R800
RLD30P900UF / RLD30P900UF-S	RUEF900K / RUEF900	MF-R900

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“Multifuse” is a registered trademark of Bourns , Inc.

“PolySwitch” is a registered trademark of Tyco Electronics.