

# Type 330 -55 °C to 105 °C Ultra-Long-Life, Switching Power Grade Radial

## High Ripple and Ultra-Long Life

The Type 330 is the ultra-long-life version of the Type 300 capacitor. With an astonishing, 50,000-hour expected life operating continuously at full load and 65 °C the 330 is the choice for power supply outputs and UPS battery stiffening. The exceptionally low ESRs enable high ripple-current capability. With series inductance of 12 to 16 nH and ripple currents to 16 amps one of these capacitors can save by replacing three or four of the 12.5 mm diameter capacitors routinely at the output of switching power supplies. Type 330 R delivers even lower ESR and higher ripple. Type 330 has three leads for rugged, reverse-proof mounting. Two leads are available as Types 331 and 331R.



## Highlights

- Expected Life > 20 years @ 45 °C
- Ripple Current to 16 amps
- ESRs to 6 mΩ
- > 90% capacitance at -40 °C
- Replaces multiple capacitors

## RoHS Compliant

## Specifications

<b>Operating Temperature:</b>	-55 °C to +105 °C
<b>Rated Voltage:</b>	6.3 to 250 Vdc
<b>Capacitance:</b>	270 µF to 33,000 µF
<b>Capacitance Tolerance:</b>	6.3 to 100 Vdc; -10 + 75%, 160 to 250 Vdc; -10 + 50%
<b>Leakage Current:</b>	≤ 0.5 $\sqrt{CV}$ µA, 4 mA max, 5 min.
<b>Cold Impedance:</b>	-55 °C multiple of 25 °C $Z \leq 4$ for 6.3 & 7.5 V, 3 for 10 to 50 V, 2 for > 50 V

## Ripple Current Multipliers:

## Ambient Temperature

45 °C	55 °C	65 °C	75 °C	85 °C	95 °C	105 °C
1.66	1.52	1.37	1.20	1.00	0.75	0.36

## Frequency

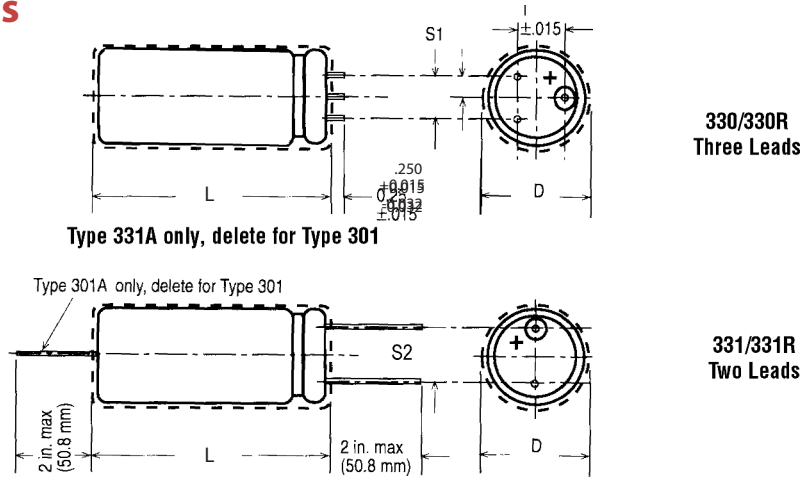
	50 Hz	60 Hz	120 Hz	360 Hz	1 kHz	5 kHz	10 kHz & up
<b>.77" Diameter</b>							
<b>6.3 &amp; 7.5 V</b>	0.82	0.86	1.00	1.15	1.21	1.24	1.25
<b>10 to 40 V</b>	0.78	0.83	1.00	1.20	1.30	1.35	1.36
<b>50V</b>	0.76	0.81	1.00	1.25	1.38	1.45	1.47
<b>63 &amp; 75 V</b>	0.74	0.80	1.00	1.28	1.43	1.52	1.54
<b>100 to 250 V</b>	0.76	0.81	1.00	1.24	1.37	1.44	1.46
<b>.895" Diameter</b>							
<b>6.3 &amp; 7.5 V</b>	0.82	0.86	1.00	1.14	1.20	1.23	1.24
<b>10 to 40 V</b>	0.80	0.84	1.00	1.17	1.25	1.29	1.30
<b>50V</b>	0.75	0.80	1.00	1.27	1.42	1.50	1.52
<b>63 &amp; 75 V</b>	0.75	0.80	1.00	1.26	1.40	1.48	1.50
<b>100 to 250 V</b>	0.76	0.81	1.00	1.25	1.38	1.46	1.48
<b>1.02" Diameter</b>							
<b>6.3 &amp; 7.5 V</b>	0.84	0.88	1.00	1.12	1.17	1.19	1.20
<b>10 to 40 V</b>	0.81	0.86	1.00	1.15	1.22	1.25	1.26
<b>50V</b>	0.76	0.81	1.00	1.23	1.35	1.42	1.44
<b>63 &amp; 75 V</b>	0.77	0.81	1.00	1.23	1.35	1.42	1.44
<b>100 to 250 V</b>	0.76	0.81	1.00	1.24	1.37	1.44	1.46

**Load Life:** 10,000 h at full load at 85 °C  
 $\Delta$  Capacitance  $\pm 20\%$   
 ESR 200% of limit  
 DCL 100% of limit

**Shelf Life:** 500 h at 105 °C, capacitance, ESR and DCL, initial requirements

# Type 330 -55 °C to 105 °C Ultra-Long-Life, Switching Power Grade Radial

## Outline Drawings



## Case Dimensions

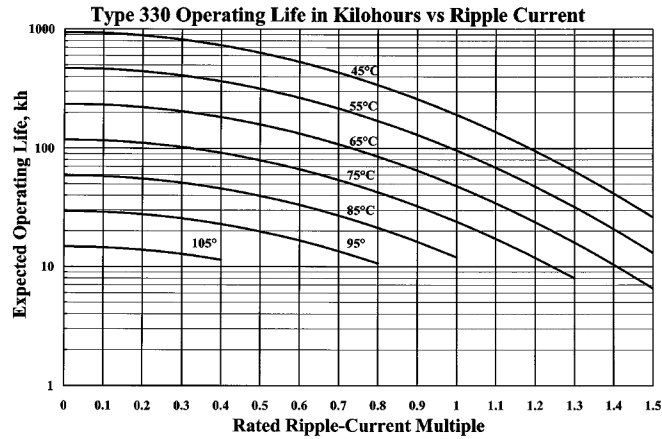
Case Code	Insulated D ± 0.015 (0.4 mm) L ± 0.062 (1.6 mm) D x L	Epoxy endseal L Max D x L	Bare Can D ± 0.015 (0.4 mm) L ± 0.030 (0.8 mm)	Lead Spacing		Lead dia.	Diameter AWG
				Type 330 S1	Type 331 S2		
				0.020 (0.5 mm)	0.020 (0.5 mm)		
<b>Case Dimensions in Inches</b>							
GT	0.765 x 3.650	3.712	0.750 x 3.625	0.200	0.300	0.040	18
HP	0.890 x 2.650	2.712	0.875 x 2.625	0.300	0.400	0.040	18
HS	0.890 x 3.150	3.212	0.875 x 3.125	0.300	0.400	0.040	18
HT	0.890 x 3.650	3.712	0.875 x 3.625	0.300	0.400	0.040	18
JL	1.015 x 2.150	2.212	1.000 x 2.125	0.300	0.400	0.040	18
JP	1.015 x 2.650	2.712	1.000 x 2.625	0.300	0.400	0.040	18
JS	1.015 x 3.150	3.212	1.000 x 3.125	0.300	0.400	0.040	18
JT	1.015 x 3.650	3.712	1.000 x 3.625	0.300	0.400	0.040	18
<b>Case Dimensions in Millimeters</b>							
GT	19.4 x 92.7	94.3	19.1 x 92.1	5.08	7.62	1.02	18
HP	22.6 x 67.3	68.9	22.2 x 66.7	7.62	10.16	1.02	18
HS	22.6 x 80.0	81.6	22.2 x 79.4	7.62	10.16	1.02	18
HT	22.6 x 92.7	94.3	22.2 x 92.1	7.62	10.16	1.02	18
JL	25.8 x 54.6	56.2	25.4 x 54.0	7.62	10.16	1.02	18
JP	25.8 x 67.3	68.9	25.4 x 66.7	7.62	10.16	1.02	18
JS	25.8 x 80.0	81.6	25.4 x 79.4	7.62	10.16	1.02	18
JT	25.8 x 92.7	94.3	25.4 x 92.1	7.62	10.16	1.02	18

## Part Numbering System

<b>330R</b>	<b>333</b>	<b>U</b>	<b>6R3</b>	<b>JS</b>	<b>2</b>	<b>E</b>
<b>Type</b>	<b>Capacitance Tolerance</b>		<b>Voltage</b>	<b>Case Code</b>	<b>Insulation</b>	<b>Epoxy</b>
330 - 3 leads	<b>100</b> = 10 μF	<b>M</b> = ±20%	<b>6R3</b> = 6.3 V	See Rating	<b>0</b> = Bare Can	<b>(blank)</b> = no epoxy
330R - 3 leads Low ESR	<b>102</b> = 1000 μF	<b>T</b> = -10% +50%	<b>063</b> = 63 V		<b>1</b> = Polyester	<b>E</b> = Epoxy endseal
331 - 2 leads		<b>U</b> = -10 +75%	<b>100</b> = 100 V		<b>2</b> = PVC	
331R - 2 leads, Low ESR					<b>8</b> = PVC w/ Standoffs	
331A - Laydown 3 leads					<b>9</b> = Polyester w/ Standoffs	

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## Typical Performance Curve



## Ratings

Cap. (µF)	Catalog Part Number	ESR Max. 25 °C		Ripple Amps, Max. 85 °C		Nominal Size D X L (in)	Cap. (µF)	Catalog Part Number	ESR Max. 25 °C		Ripple Amps, Max. 85 °C		Nominal Size D X L (in)
		120 Hz (mΩ)	20 kHz (mΩ)	120 Hz (A)	20 kHz (A)				120 Hz (mΩ)	20 kHz (mΩ)	120 Hz (A)	20 kHz (A)	
<b>6.3 Vdc (9 Vdc Surge)</b>							<b>7.5 Vdc (10 Vdc Surge) (cont'd.)</b>						
15000	330153U6R3GT2	26.6	15.1	7.10	8.86	0.77 X 3.65	33000	330333U7R5JT2	17.0	11.2	10.40	12.10	1.02 X 3.65
15000	330R153U6R3GT2	23.0	13.1	7.62	9.52	0.77 X 3.65	33000	330R333U7R5JT2	10.6	5.9	13.10	16.60	1.02 X 3.65
15000	330153U6R3HP2	27.1	16.5	6.57	7.93	0.895 X 2.65	<b>10 Vdc (15 Vdc Surge)</b>						
15000	330R153U6R3HP2	19.5	11.3	7.75	9.60	0.895 X 2.65	12000	330123U010GT2	28.3	15.0	6.88	8.91	0.77 X 3.65
18000	330183U6R3JL2	29.6	20.1	6.08	6.95	1.02 X 2.15	12000	330R123U010GT2	24.5	13.0	7.39	9.57	0.77 X 3.65
18000	330R183U6R3JL2	19.1	10.9	7.57	9.45	1.02 X 2.15	12000	330123U010HP2	28.7	16.6	6.39	7.91	0.895 X 2.65
22000	330223U6R3HS2	22.4	13.7	7.88	9.51	0.895 X 3.15	12000	330R123U010HP2	20.8	11.5	7.49	9.53	0.895 X 2.65
22000	330R223U6R3HS2	15.9	9.2	9.35	11.60	0.895 X 3.15	12000	330123U010JL2	31.0	19.9	5.93	6.99	1.02 X 2.15
22000	330223U6R3JP2	23.0	15.6	7.66	8.75	1.02 X 2.65	12000	330R123U010JL2	20.3	11.4	7.33	9.23	1.02 X 2.15
22000	330R223U6R3JP2	14.7	8.4	9.59	12.00	1.02 X 2.65	15000	330153U010HS2	23.7	13.7	7.66	9.49	0.895 X 3.15
27000	330273U6R3HT2	19.4	11.9	9.04	10.90	0.895 X 3.65	15000	330R153U010HS2	17.0	9.3	9.05	11.50	0.895 X 3.15
27000	330R273U6R3HT2	13.6	7.9	10.80	13.40	0.895 X 3.65	18000	330183U010HT2	20.5	11.9	8.81	10.90	0.895 X 3.65
27000	330273U6R3JS2	19.2	13.0	9.11	10.40	1.02 X 3.15	18000	330R183U010HT2	14.5	8.0	10.50	13.30	0.895 X 3.65
27000	330R273U6R3JS2	15.1	8.6	10.30	12.80	1.02 X 3.15	18000	330183U010JP2	24.1	15.4	7.48	8.81	1.02 X 2.65
33000	330333U6R3JT2	16.7	11.4	10.50	12.00	1.02 X 3.65	18000	330R183U010JP2	15.6	8.7	9.29	11.70	1.02 X 2.65
33000	330R333U6R3JT2	10.4	5.9	13.30	16.60	1.02 X 3.65	22000	330223U010JS2	20.1	12.8	8.90	10.50	1.02 X 3.15
<b>7.5 Vdc (10 Vdc Surge)</b>							22000	330R223U010JS2	16.1	9.0	9.94	12.50	1.02 X 3.15
12000	330123U7R5GT2	27.2	15.0	7.01	8.91	0.77 X 3.65	27000	330273U010JT2	17.5	11.2	10.30	12.10	1.02 X 3.65
12000	330R123U7R5GT2	23.6	13.0	7.53	9.57	0.77 X 3.65	27000	330R273U010JT2	11.0	6.2	12.90	16.30	1.02 X 3.65
15000	330153U7R5HP2	27.7	16.6	6.50	7.91	0.895 X 2.65	<b>16 Vdc (25 Vdc Surge)</b>						
15000	330R153U7R5HP2	20.0	11.0	7.65	9.73	0.895 X 2.65	10000	330103U016GT2	29.2	14.9	6.77	8.94	0.77 X 3.65
15000	330153U7R5JL2	30.1	19.9	6.02	6.99	1.02 X 2.15	10000	330R103U016GT2	25.3	12.9	7.27	9.60	0.77 X 3.65
15000	330R153U7R5JL2	19.6	10.9	7.47	9.41	1.02 X 2.15	10000	330103U016HP2	29.5	17.1	6.30	7.79	0.895 X 2.65
18000	330183U7R5HS2	22.9	13.8	7.79	9.48	0.895 X 3.15	10000	330R103U016HP2	21.6	11.9	7.36	9.36	0.895 X 2.65
18000	330R183U7R5HS2	16.3	9.0	9.23	11.74	0.895 X 3.15	10000	330103U016JL2	31.8	19.7	5.86	7.01	1.02 X 2.15
22000	330223U7R5HT2	19.8	11.9	8.95	10.89	0.895 X 3.65	10000	330R103U016JL2	21.0	11.1	7.21	9.33	1.02 X 2.15
22000	330R223U7R5HT2	13.9	7.7	10.70	13.60	0.895 X 3.65	12000	330123U016HS2	24.4	14.1	7.55	9.35	0.895 X 3.15
22000	330223U7R5JP2	23.4	15.5	7.59	8.80	1.02 X 2.65	12000	330R123U016HS2	17.6	9.7	8.89	11.30	0.895 X 3.15
22000	330R223U7R5JP2	15.0	8.4	9.47	11.90	1.02 X 2.65	15000	330153U016HT2	21.1	12.2	8.69	10.80	0.895 X 3.65
27000	330273U7R5JS2	19.5	12.9	9.03	10.50	1.02 X 3.15	15000	330R153U016HT2	15.0	8.2	10.30	13.10	0.895 X 3.65
27000	330R273U7R5JS2	15.5	8.7	10.10	12.80	1.02 X 3.15	15000	330153U016JP2	24.7	15.3	7.39	8.85	1.02 X 2.65



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Cap. (µF)	Catalog Part Number	ESR Max. 25 °C		Ripple Amps, Max. 85 °C		Nominal Size D X L (in)
		120 Hz (mΩ)	20 kHz (mΩ)	120 Hz (A)	20 kHz (A)	
<b>75 Vdc (100 Vdc Surge) (cont'd.)</b>						
1800	330R182U075GT2	54.3	23.4	4.96	7.13	0.77 X 3.65
2200	330222U075HP2	60.6	27.9	4.39	6.11	0.895 X 2.65
2200	330R222U075HP2	48.5	20.9	4.91	7.06	0.895 X 2.65
2200	330222U075JL2	60.8	30.4	4.24	5.65	1.02 X 2.15
2200	330R222U075JL2	46.2	20.3	4.86	6.91	1.02 X 2.15
2700	330272U075HS2	49.2	22.6	5.32	7.39	0.895 X 3.15
2700	330R272U075HS2	39.1	16.8	5.96	8.57	0.895 X 3.15
2700	330272U075HT2	41.8	19.2	6.17	8.58	0.895 X 3.65
2700	330R272U075HT2	32.9	14.2	6.95	9.99	0.895 X 3.65
2700	330272U075JP2	46.4	23.2	5.39	7.18	1.02 X 2.65
2700	330R272U075JP2	35.0	15.4	6.21	8.82	1.02 X 2.65
3300	330332U075JS2	37.9	19.0	6.47	8.63	1.02 X 3.15
3300	330R332U075JS2	28.3	12.5	7.49	10.60	1.02 X 3.15
3900	330392U075JT2	32.4	16.2	7.53	10.00	1.02 X 3.65
3900	330R392U075JT2	23.9	10.5	8.76	12.40	1.02 X 3.65
<b>100 Vdc (140 Vdc Surge)</b>						
820	330821U100GT2	99.5	37.8	3.67	5.61	0.77 X 3.65
820	330R821U100GT2	86.2	32.8	3.94	6.02	0.77 X 3.65
1000	330102U100HP2	94.7	36.0	3.51	5.38	0.895 X 2.65
1000	330R102U100HP2	78.1	29.7	3.87	5.92	0.895 X 2.65
1000	330102U100JL2	92.7	37.1	3.43	5.12	1.02 X 2.15
1000	330R102U100JL2	73.8	28.8	3.85	5.81	1.02 X 2.15
1200	330122U100HS2	76.5	29.1	4.26	6.52	0.895 X 3.15
1200	330R122U100HS2	62.8	23.9	4.71	7.20	0.895 X 3.15
1200	330122U100HT2	64.5	24.5	4.96	7.59	0.895 X 3.65
1200	330R122U100HT2	52.6	20.0	5.50	8.41	0.895 X 3.65
1200	330122U100JP2	70.3	28.1	4.38	6.53	1.02 X 2.65
1200	330R122U100JP2	55.7	21.7	4.92	7.43	1.02 X 2.65
1500	330152U100JS2	57.0	22.8	5.28	7.87	1.02 X 3.15
1500	330R152U100JS2	44.9	17.5	5.95	8.99	1.02 X 3.15

Cap. (µF)	Catalog Part Number	ESR Max. 25 °C		Ripple Amps, Max. 85 °C		Nominal Size D X L (in)
		120 Hz (mΩ)	20 kHz (mΩ)	120 Hz (A)	20 kHz (A)	
<b>100 Vdc (140 Vdc Surge) (cont'd.)</b>						
2200	330222U100JT2	48.3	19.3	6.17	9.19	1.02 X 3.65
2200	330R222U100JT2	37.7	14.7	6.97	10.50	1.02 X 3.65
<b>160 Vdc (200 Vdc Surge)</b>						
330	330331T160GT2	306	116	2.09	3.20	0.77 X 3.65
390	330391T160HP2	268	102	2.09	3.19	0.895 X 2.65
390	330391T160JL2	278	111	1.98	2.95	1.02 X 2.15
470	330471T160HS2	226	85.7	2.48	3.80	0.895 X 3.15
470	330471T160JP2	228	91.4	2.43	3.62	1.02 X 2.65
560	330561T160HT2	189	71.8	2.90	4.44	0.895 X 3.65
560	330561T160JS2	184	73.5	2.94	4.39	1.02 X 3.15
680	330681T160JT2	154	61.6	3.45	5.15	1.02 X 3.65
<b>200 Vdc (250 Vdc Surge)</b>						
330	330331T200GT2	384	177	1.87	2.59	0.77 X 3.65
330	330331T200HP2	358	165	1.81	2.51	0.895 X 2.65
390	330391T200HS2	288	132	2.20	3.06	0.895 X 3.15
390	330391T200JL2	339	156	1.79	2.49	1.02 X 2.15
470	330471T200HT2	240	111	2.57	3.57	0.895 X 3.65
470	330471T200JP2	255	117	2.30	3.19	1.02 X 2.65
560	330561T200JS2	205	94.4	2.78	3.87	1.02 X 3.15
680	330681T200JT2	172	79.1	3.27	4.54	1.02 X 3.65
<b>250 Vdc (300 Vdc Surge)</b>						
270	330271T250GT2	455	191	1.72	2.50	0.77 X 3.65
270	330271T250HP2	423	178	1.66	2.42	0.895 X 2.65
270	330271T250JL2	400	168	1.65	2.40	1.02 X 2.15
330	330331T250HS2	340	143	2.02	2.94	0.895 X 3.15
390	330391T250HT2	284	119	2.37	3.44	0.895 X 3.65
390	330391T250JP2	301	126	2.12	3.08	1.02 X 2.65
470	330471T250JS2	242	102	2.56	3.73	1.02 X 3.15
560	330561T250JT2	202	85.0	3.01	4.38	1.02 X 3.65

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[URZ0J470MDD1TD](#) [URZ1C220MDD1TD](#) [URZ1E4R7MDD1TD](#) [URZ1H4R7MDD1TD](#) [URZ1J330MPD1TD](#) [URZ1V330MDD1TD](#)  
[11BF65K00230](#) [11G460](#) [11BF50K00230](#) [11BF80K00230](#) [11G464](#) [UVR0J101MDD6TP](#) [UVR0J470MDD6TP](#) [UVR1A330MDD6TP](#)  
[UVR1C330MDD6TP](#) [UVR1E220MDD6TP](#) [UVR1E330MDD6TP](#) [UVR1H3R3MDD6TP](#) [UVR1HR47MDD6TP](#) [UVR1V4R7MDD6TP](#) [ECE-](#)  
[A1EKS100](#) [300R102U010GE2E](#) [UVR0J221MDD1TA](#) [UPB2G100MPD1TD](#) [UPM1H560MED1CA](#) [UPW1J4R7MDD1TA](#) [URY2W100MHD](#)  
[UVK2GR47MED1TD](#) [ECA-2DHG100B](#) [ECE-A1AKS221I](#)