

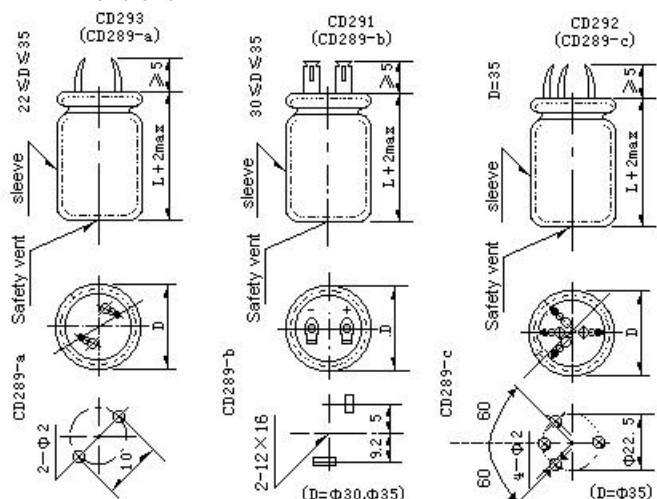
CD293(CD289-a) CD292(CD289-c) Series CD291(CD289-b)

- Standard product, suited for use in filtering in switching power supplies circuit
- Load life of 2000 hours at 85°C

■ Specifications

Item	Characteristics																											
Operating Temperature Range	10V ~ 250V : -40°C ~ +85°C	315V ~ 450V : -25°C ~ +85°C																										
Rated Voltage Range	10V ~ 450V																											
Nominal Capacitance Range	47 μ F ~ 22000 μ F																											
Capacitance Tolerance	M ($\pm 20\%$) (20°C, 120Hz)																											
Leakage Current	$I \leq 0.02C_R U_R$ (μ A) C _R : Nominal capacitance (μ F) U _R : Rated voltage(V) (20°C, after 5 minutes)																											
Dissipation Factor (Max)	<table border="1"> <tr> <th>U_R(V)</th> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>80</td> <td>100</td> <td>160~200</td> <td>250~400</td> <td>450</td> </tr> <tr> <th>tan δ</th> <td>0.50</td> <td>0.50</td> <td>0.40</td> <td>0.40</td> <td>0.30</td> <td>0.25</td> <td>0.20</td> <td>0.15</td> <td>0.12</td> <td>0.15</td> <td>0.20</td> </tr> </table> (20°C, 120Hz)		U _R (V)	10	16	25	35	50	63	80	100	160~200	250~400	450	tan δ	0.50	0.50	0.40	0.40	0.30	0.25	0.20	0.15	0.12	0.15	0.20		
U _R (V)	10	16	25	35	50	63	80	100	160~200	250~400	450																	
tan δ	0.50	0.50	0.40	0.40	0.30	0.25	0.20	0.15	0.12	0.15	0.20																	
Low Temperature Stability (Impedance Ratio)	<table border="1"> <tr> <th>U_R(V)</th> <td>10</td> <td>16 ~ 160</td> <td>200 ~ 250</td> <td>315 ~ 400</td> <td>450</td> </tr> <tr> <th>Z(-25°C)/Z(+20°C)</th> <td>5</td> <td>4</td> <td>7</td> <td>8</td> <td>8</td> </tr> <tr> <th>Z(-40°C)/Z(+20°C)</th> <td>18</td> <td>15</td> <td>12</td> <td>—</td> <td>—</td> </tr> </table> (120Hz)		U _R (V)	10	16 ~ 160	200 ~ 250	315 ~ 400	450	Z(-25°C)/Z(+20°C)	5	4	7	8	8	Z(-40°C)/Z(+20°C)	18	15	12	—	—								
U _R (V)	10	16 ~ 160	200 ~ 250	315 ~ 400	450																							
Z(-25°C)/Z(+20°C)	5	4	7	8	8																							
Z(-40°C)/Z(+20°C)	18	15	12	—	—																							
Load Life	After 2000 hours' application of rated voltage with rated ripple current at 85°C, the capacitor shall meet the following requirement: <table border="1"> <tr> <td>Capacitance change</td> <td>Within $\pm 20\%$ of the initial value.</td> </tr> <tr> <td>Dissipation factor</td> <td>Not more than 200% of the initial specified value.</td> </tr> <tr> <td>Leakage current</td> <td>Not more than the initial specified value.</td> </tr> </table>		Capacitance change	Within $\pm 20\%$ of the initial value.	Dissipation factor	Not more than 200% of the initial specified value.	Leakage current	Not more than the initial specified value.																				
Capacitance change	Within $\pm 20\%$ of the initial value.																											
Dissipation factor	Not more than 200% of the initial specified value.																											
Leakage current	Not more than the initial specified value.																											
Shelf Life	After storage for 1000 hours at +85°C, the capacitors shall meet the requirement of load life above.																											
Rated Ripple Current & Frequency Multipliers	<table border="1"> <tr> <th rowspan="2">U_R</th> <th>Freq.</th> <th>50 Hz</th> <th>120 Hz</th> <th>1k Hz</th> <th>10k Hz</th> <th>20k Hz</th> </tr> <tr> <td>$\leq 50V$</td> <td>0.95</td> <td>1.00</td> <td>1.10</td> <td>1.15</td> <td>1.15</td> </tr> <tr> <td rowspan="2">$63V \sim 100V$</td> <td></td> <td>0.95</td> <td>1.00</td> <td>1.16</td> <td>1.30</td> <td>1.33</td> </tr> <tr> <td>$\geq 160V$</td> <td>0.90</td> <td>1.00</td> <td>1.20</td> <td>1.50</td> <td>1.55</td> </tr> </table>		U _R	Freq.	50 Hz	120 Hz	1k Hz	10k Hz	20k Hz	$\leq 50V$	0.95	1.00	1.10	1.15	1.15	$63V \sim 100V$		0.95	1.00	1.16	1.30	1.33	$\geq 160V$	0.90	1.00	1.20	1.50	1.55
U _R	Freq.	50 Hz		120 Hz	1k Hz	10k Hz	20k Hz																					
	$\leq 50V$	0.95	1.00	1.10	1.15	1.15																						
$63V \sim 100V$		0.95	1.00	1.16	1.30	1.33																						
	$\geq 160V$	0.90	1.00	1.20	1.50	1.55																						
Rated Ripple Current & Temperature Multipliers	<table border="1"> <tr> <th colspan="2">Temperature</th> <th>+40°C</th> <th>+55°C</th> <th>+70°C</th> <th>+85°C</th> </tr> <tr> <th rowspan="2">U_R(V)</th> <td>< 160</td> <td>2.1</td> <td>2.1</td> <td>1.5</td> <td>1.0</td> </tr> <tr> <td>≥ 160</td> <td>1.7</td> <td>1.5</td> <td>1.3</td> <td>1.0</td> </tr> </table>		Temperature		+40°C	+55°C	+70°C	+85°C	U _R (V)	< 160	2.1	2.1	1.5	1.0	≥ 160	1.7	1.5	1.3	1.0									
Temperature		+40°C	+55°C	+70°C	+85°C																							
U _R (V)	< 160	2.1	2.1	1.5	1.0																							
	≥ 160	1.7	1.5	1.3	1.0																							

■ Dimensions



		mm					
D ± 1.5		22					
L		25	30	35	40	45	50
D ± 1.5		25					
L		25	30	35	40	45	50
D ± 1.5		30					
L		25	30	35	40	45	50
D ± 1.5		35					
L		25	30	35	40	45	50

CD293(CD289-a)
 CD292(CD289-c) Series
 CD291(CD289-b)

■ Nominal capacitance, rated voltage, rated ripple current and case size table

U _R (V) Item C _R (μF)	10		16		25		35	
	D×L mm	I~	D×L mm	I~	D×L mm	I~	D×L mm	I~
3300							22×25	1880
3900							22×30	2110
4700	Rated ripple current (mA rms) (85°C, 120Hz)						22×30	2220
							25×25	2200
5600					22×25	2200	22×35 22×30	2330 2330
6800					22×30 25×25	2330 2330	22×40 25×35 30×25	2990 2960 2970
8200			22×25	2220	22×35	2660	22×50 25×40 30×30 35×25	2850 2850 2850 2900
10000	22×25	2750	22×30 25×25	2660 2660	22×40 25×30 30×25	2990 2880 2880	25×45 30×35	3200 3300
12000	22×30	3300	22×35	2990	22×45 25×35 30×30	3330 3320 3400	25×50 30×40 35×30	3600 3600 3700
15000	22×30 25×25	3320 3310	22×40 25×30 30×25	3330 3330 3340	25×40 30×30 35×25	3870 3800 3900	30×45 35×35	4200 4200
18000	22×30 22×35	3960 3960	22×45 25×35	3880 3870	25×50 30×35 35×30	4350 4320 4300	30×50 35×40	4700 4700
22000	22×40 25×35 30×25	4400 4410 4410	22×50 25×40 30×30 35×25	4420 4420 4420 4440	30×40 35×35	4900 5000	35×45	5400

CD293(CD289-a)
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■ Nominal capacitance, rated voltage, rated ripple current and case size table

U _R (V) Item C _R (uF)	50		63		80		100	
	D×L mm	I~	D×L mm	I~	D×L mm	I~	D×L mm	I~
220							22×25 25×30	620 800
680							22×25 22×35	1100 1360
820							22×30 22×40	1210 1420
1000					22×25 30×35	1300 1800	22×35 25×25 25×40	1630 1450 1800
1200					22×30 22×40	1510 1720	22×35 25×30 25×40	1630 1610 1850
1500			22×25	1620	22×35 25×25 22×40 25×40	1960 1710 2020 2310	25×50 25×35 25×50	1810 1720 2000
1800			22×30	1930	22×35 25×30 25×40	1950 1920 2210	25×50 25×40 30×30 30×40	2170 2160 2150 2400
2200	22×25	1800	22×30 25×25	2100 2050	22×40 25×35 30×25 25×50	2150 2280 2240 2600	25×45 30×35 35×30 30×50	2240 2330 2330 2800
2700	22×30 25×25	1950 1900	22×35 25×30	2250 2330	22×50 25×40 30×30 25×50	2570 2540 2510 2800	25×50 30×40 35×50	2620 2610 3000
3300	22×35 25×30	2200 2100	22×40 25×35	2370 2360	25×45 30×35 25×50 30×50	2850 2820 3000 3400	30×45 35×35 35×50	3100 3050 3700
3900	22×35 25×35 30×25	2320 2310 2300	22×45 25×40 30×30 35×25	2520 2600 2510 2500	25×50 30×40 35×30 30×50	3240 3230 3200 3600	30×50 35×40 35×50	3440 3420 3800
4700	22×40 25×35 25×50	2640 2640 2770	22×50 25×45 25×50	2910 3040 3200	30×45 35×35 35×45	3670 3640 4100	35×50	4080
5600	22×50 25×40 30×30 35×25	2560 2580 2540 2510	25×45 30×35 35×30	3140 3220 3300	30×50 35×40 35×50	3530 3510 3900		
6800	25×45 30×35	2830 2800	30×40 35×35 30×50	3600 3720 4000	35×50	4100		
8200	25×50 30×40 35×30	3500 3400 3300	30×50 35×40	3700 3800				
10000	30×45 35×35 30×50	3700 3700 3800	35×45 35×50	4300 4600				
12000	30×50 35×40	4100 4000	35×50	4800				
15000	35×50	4550						

↑ Rated ripple current (mA rms) (85°C, 120Hz)

CD293(CD289-a)
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 CD291(CD289-b)

■ Nominal capacitance, rated voltage, rated ripple current and case size table

U _R (V) Item C _R (uF)	160		180		200		250	
	D×L mm	I~	D×L mm	I~	D×L mm	I~	D×L mm	I~
100							22×25	660
150					22×25	800	22×25	800
180	22×25	880	22×25	880	22×25	880	22×30	960
220	22×25 22×30	980 1070	22×25	980	22×25 22×30	980 1070	22×35 25×25	1160 1040
270	22×25 22×30	1080 1180	22×30	1180	22×30 25×25	1180 1150	22×40 25×30 30×25	1360 1260 1260
330	22×30 22×35 25×25	1310 1415 1300	22×35 25×25	1415 1270	22×35 25×30	1415 1400	22×40 25×35 22×45	1500 1490 1590
390	22×35 25×30	1540 1520	22×40 25×30 30×25	1640 1520 1520	22×35 25×30	1540 1520	25×45 25×40 30×30	1730 1740 1650
470	22×35 25×30 22×40	1680 1660 1790	22×40 25×35 30×30	1800 1790 1820	22×40 25×35 22×45 25×40	1800 1790 1910 1920	25×45 30×35 35×25	2030 1960 1790
560	22×40 25×35	1950 1940	22×45 25×40 30×30	2070 2080 2070	22×45 25×40 30×30 35×25	2070 2080 2070 2060	25×50 30×40 35×30	2320 2270 2120
680	22×45 25×40 30×30	2110 2120 2110	22×50 25×45 30×35 35×30	2220 2240 2190 2190	22×50 25×45 30×35 35×30	2220 2240 2190 2190	30×45 35×35	2450 2330
820	22×50 25×45 30×35	2440 2470 2400	25×50 30×40 35×35	2360 2310 2260	25×50 30×40 35×35	2360 2310 2260	30×50 35×40	2580 2420
1000	25×50 30×40 35×35	2700 2650 2600	30×45 35×40	2800 2850	30×45 35×40	2800 2850	35×45	3024
1200	30×45 35×40	3080 3130	30×50 35×45	3240 3400	30×50 35×45	3240 3400	35×50	3580
1500	30×50 35×45	3620 3700	35×50	3910	35×50	3910		
1800	35×50	4280	↑ Rated ripple current (mA rms) (85°C, 120Hz)					

CD293(CD289-a)
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 CD291(CD289-b)

■ Nominal capacitance, rated voltage, rated ripple current and case size table

U _R (V) Item C _R (uF)	315		350		400		450	
	D×L mm	I~	D×L mm	I~	D×L mm	I~	D×L mm	I~
47					22×25	460	22×25	430
56					22×25	500	22×25	470
68	Rated ripple current (mA rms) (85°C,120Hz)				22×25 22×30	560 610	22×30	570
82			22×25	660	22×30	640	22×30 25×25	620 600
100	22×25	670	22×25	720	22×30 25×25 22×40	720 710 830	22×35 25×30 22×40	720 730 740
120	22×25	740	22×30 25×25	840 820	25×35 25×25	800 720	22×40 25×35 30×30	800 800 810
150	22×30 25×25	860 850	22×35 25×30	960 950	22×40 25×30 30×25	1010 930 930	22×50 25×40 30×30	950 950 980
180	22×35 25×30	970 960	22×40 25×35 30×25	1150 1130 1100	22×45 25×35 30×30 35×25	1070 1010 1020 1010	25×45 30×40 25×50	1100 1340 1160
220	22×40 25×35 30×25	1150 1140 1110	22×45 25×35 30×30 35×25	1250 1200 1230 1200	22×50 25×40 25×50	1370 1340 1500	25×50 30×40 35×30	1200 1300 1300
270	22×45 25×40 30×30 35×25	1350 1330 1320 1300	25×45 30×35 35×30	1450 1430 1430	25×45 30×40 25×50	1570 1590 1630	25×50 30×45 35×35	1350 1400 1500
330	25×45 30×35 35×30	1440 1420 1470	25×50 30×40 35×30	1660 1650 1630	25×50 30×40 30×45 30×50	1800 1760 1870 1975	30×50 35×40	1630 1570
390	25×50 30×40 35×30	1650 1630 1600	30×40 35×35	1750 1800	30×45 35×40 30×50	1990 2030 2100	35×45	1900
470	30×45 35×35	1810 1850	30×45 35×40	2050 2100	30×50 35×40	2245 2350	35×50	2200
560	30×50 35×40	2050 2030	35×45	2310	35×45	2740		
680	35×45	2300	35×50	2620	35×50			