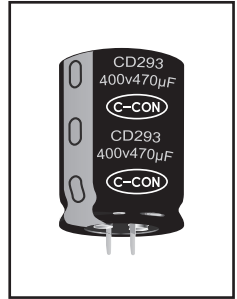


2000h at 85°C

- Standard 85°C

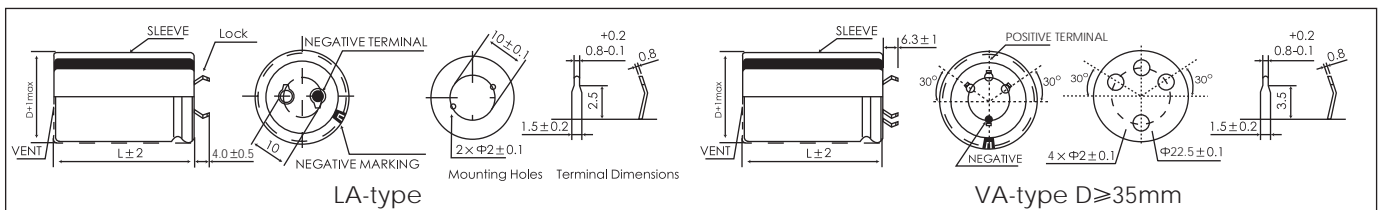


Items	Characteristics																																								
Operating Temperature Range (°C)	-40 ~ +85	-25 ~ +85																																							
Voltage Range (V)	10 ~ 400	420 ~ 500																																							
Capacitance Range (µF)	100 ~ 82000																																								
Capacitance Tolerance (20°C, 120Hz)	± 20%																																								
Leakage Current (µA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (µF) V: Rated Voltage (V)																																								
Dissipation Factor (20°C, 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>10~16</th> <th>25</th> <th>35~50</th> <th>63</th> <th>80~100</th> </tr> </thead> <tbody> <tr> <td>Cap (µF) ≤ 2700</td> <td>-</td> <td>-</td> <td>0.20</td> <td>0.15</td> <td>0.15</td> </tr> <tr> <td>3300 ~ 4700</td> <td>-</td> <td>0.35</td> <td>0.25</td> <td>0.20</td> <td>0.15</td> </tr> <tr> <td>5600 ~ 6800</td> <td>0.40</td> <td>0.35</td> <td>0.30</td> <td>0.20</td> <td>0.20</td> </tr> <tr> <td>≥ 8200</td> <td>0.40</td> <td>0.35</td> <td>0.35</td> <td>0.25</td> <td>0.25</td> </tr> </tbody> </table>	Rated Voltage (V)	10~16	25	35~50	63	80~100	Cap (µF) ≤ 2700	-	-	0.20	0.15	0.15	3300 ~ 4700	-	0.35	0.25	0.20	0.15	5600 ~ 6800	0.40	0.35	0.30	0.20	0.20	≥ 8200	0.40	0.35	0.35	0.25	0.25	<table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>160~200</th> <th>250~500</th> </tr> </thead> <tbody> <tr> <td>Φ (mm) 22 ~ 30</td> <td>0.10</td> <td>0.15</td> </tr> <tr> <td>35 ~ 40</td> <td>0.12</td> <td>0.15</td> </tr> </tbody> </table>	Rated Voltage (V)	160~200	250~500	Φ (mm) 22 ~ 30	0.10	0.15	35 ~ 40	0.12	0.15
	Rated Voltage (V)	10~16	25	35~50	63	80~100																																			
	Cap (µF) ≤ 2700	-	-	0.20	0.15	0.15																																			
	3300 ~ 4700	-	0.35	0.25	0.20	0.15																																			
5600 ~ 6800	0.40	0.35	0.30	0.20	0.20																																				
≥ 8200	0.40	0.35	0.35	0.25	0.25																																				
Rated Voltage (V)	160~200	250~500																																							
Φ (mm) 22 ~ 30	0.10	0.15																																							
35 ~ 40	0.12	0.15																																							
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	10	10~35	50~100	160~200	250~400	420~500																																		
	Z <sub>-25°C</sub> / Z <sub>+20°C</sub>	5	4	3	4																																				
	Z <sub>-40°C</sub> / Z <sub>+20°C</sub>	18	15	10	6	8	-																																		

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	4000h	> 65000h	2000h	3000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 15% of initial value	Within ± 20% of initial value	Within ± 15% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 150% of specified value	Not more than 200% of specified value	Not more than 150% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 85°C	U <sub>R</sub> 1.2 x I <sub>R</sub> 40°C	U <sub>R</sub> I <sub>R</sub> 85°C	U <sub>R</sub> I <sub>R</sub> = 0 85°C	U <sub>R</sub> = 0 I <sub>R</sub> = 0 85°C After test: U <sub>R</sub> to be applied for 30min >24h before measurement

## Dimensions

mm



Ratings for CD 293 Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cittance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)
10 (13) 1A	18000	30	24	3.6	25X30
	22000	25	20	4	22X40
		25	20	4.1	25X35
	33000	17	13	4.6	25X40
		17	13	4.8	30X30
	39000	14	10.9	5.2	25X45
		14	10.9	5.3	30X35
	47000	12	9.1	6	30X40
		12	9.1	6	35X30
	56000	9.5	7.6	6.8	35X35
68000	7.9	6.3	7.7	35X40	
82000	6.5	5.2	8.7	35X45	
16 (20) 1C	15000	36	29	3.3	22X40
	18000	36	29	3.3	25X30
		30	24	3.8	22X45
	22000	30	24	3.7	25X35
		25	20	4.2	25X40
	27000	25	20	4.2	30X30
		20	16	5	25X45
	33000	20	16	5	30X35
		17	13	5.6	35X30
	39000	14	11	6.3	35X35
47000	12	9.1	7.2	35X40	
56000	9.5	7.6	8	35X45	
25 (32) 1E	10000	47	38	2.9	22X40
	12000	47	38	2.8	25X30
		39	31	3.2	25X35
	15000	39	31	3.4	30X30
		31	25	3.7	25X40
	18000	31	25	3.9	35X25
		26	21	4.2	30X35
	22000	26	21	4.4	35X30
		22	17	5	35X35
	33000	15	12	6.5	35X40
39000	12	10	7.5	35X45	
47000	10	8	8.8	35X50	
35 (44) 1V	5600	72	57	2.3	22X35
	6800	72	57	2.3	25X30
		59	47	2.9	22X40
	8200	59	47	2.6	25X35
		57	46	2.8	25X40
	10000	57	46	2.8	30X30
		47	38	3.2	30X35
	12000	47	38	2.8	35X20
		39	31	3.6	35X30
	15000	31	25	4.1	35X35
18000	26	21	4.7	35X40	
22000	22	17	5.3	35X45	
27000	18	14	7	35X50	
50 (63) 1H	2200	120	97	1.7	22X25
	3900	86	69	2.1	25X30
	4700	71	57	2.4	22X40
		71	57	2.4	25X35
	5600	72	57	2.5	25X40
		72	57	2.5	30X30
	6800	59	47	2.8	25X45
		59	47	2.8	30X35
	8200	57	46	3	30X40
		57	46	3	35X30
10000	47	38	3.4	35X35	
12000	39	31	3.8	35X40	
15000	31	25	4.5	35X50	
63 (79) 1J	2700	74	59	2.3	25X30
	3300	81	65	2.3	22X40
		81	65	2.3	25X35
	3900	69	55	2.6	25X40
		69	55	2.6	30X30
	4700	56	45	3	25X45
		56	45	3	30X30
	5600	48	38	3.3	35X30
	6800	40	32	3.7	35X35
	8200	41	33	3.8	35X40
10000	34	27	4.3	35X45	
12000	28	23	4.8	35X50	
80 (100) 1K	1800	111	89	1.9	25X30
	2200	91	73	2.2	25X35
		91	73	2.2	30X25
	2700	74	59	2.5	25X40
		74	59	2.5	30X30
	3300	61	49	2.8	25X45
		61	49	2.8	30X35
	3900	52	41	3.1	25X50
		52	41	3.2	35X30
	4700	43	34	3.6	35X35
5600	48	38	3.8	35X40	

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cittance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)
80 (100) 1K	6800	40	32	4.1	35X45
	8200	41	33	4.7	35X50
		10000	34	27	5.2
	12000	28	23	5.8	35X55
100 (125) 2A	1200	166	133	1.6	25X30
	1500	133	107	1.8	22X40
		133	107	1.7	25X35
	1800	111	89	2	25X40
		111	89	2.1	30X30
	2200	91	73	2.3	30X35
		91	73	2.5	35X30
	2700	74	59	2.6	25X50
		74	59	2.7	30X40
	3300	61	49	3.1	35X35
3900	52	41	3.4	35X40	
4700	43	34	4	35X50	
160 (200) 2C	470	283	226	1.6	25X30
	560	237	190	1.9	22X35
		237	190	1.9	25X30
	680	196	157	2.1	22X40
		196	157	2.2	25X35
	820	162	130	2.4	25X40
		162	130	2.5	30X30
	1000	133	107	2.8	30X35
		160	128	2.7	35X30
	1200	133	107	3	35X35
1500	107	85	3.5	35X40	
1800	89	71	3.9	35X45	
2200	73	58	4.5	35X50	
180 (225) 2K	680	196	157	2.2	25X40
	820	196	157	2.3	30X30
		162	130	2.6	30X35
	1000	195	156	2.5	35X30
		133	107	2.9	25X50
	1200	133	107	2.9	30X40
		133	107	3.1	35X35
	1500	107	85	3.6	35X45
	1800	89	71	4.1	35X50
	390	341	273	1.6	25X30
200 (250) 2D	470	283	226	1.7	22X35
	560	283	226	1.9	30X25
		237	190	2	25X35
	680	237	190	2.1	30X30
		196	157	2.3	25X40
	820	196	157	2.4	30X35
		162	130	2.7	30X40
	1000	195	156	2.5	35X30
		160	128	2.8	35X35
	1200	133	107	3.2	35X40
1500	107	85	3.8	35X50	
250 (300) 2E	330	603	483	1.4	22X40
	390	603	483	1.4	25X30
		511	409	1.6	22X45
	470	511	409	1.6	25X35
		424	339	1.8	25X40
	560	424	339	1.8	30X30
		356	285	2	25X45
	680	356	285	2	30X35
		293	235	2.3	30X40
	820	293	235	2.3	35X30
243		195	2.4	25X40	
315 (365) 2F	243	195	2.6	30X45	
	1000	243	195	2.6	35X35
		199	160	3	35X40
	1200	166	133	3.4	35X45
		180	1106	885	0.96
	220	905	724	1.1	22X40
		905	724	1.1	25X35
	270	737	590	1.2	22X45
		737	590	1.3	25X40
	330	737	590	1.3	30X30
603		483	1.4	25X45	
390	603	483	1.4	30X35	
	511	409	1.6	30X40	
470	511	409	1.6	35X30	
	424	339	1.8	30X45	
560	424	339	1.8	35X35	
	356	285	2	30X50	
680	356	285	2	35X40	
	293	235	2.3	35X45	
150	1327	1062	0.94	25X30	
350 (400) 2V	180	1106	885	1.1	22X40
	220	1106	885	1.1	30X25
		905	724	1.2	25X35
		905	724	1.2	30X30

SNAP-IN/LUG

## Ratings for CD 293 Series

SNAP-IN/LUG

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)
350 (400) 2V	270	737	590	1.4	25X45
		737	590	1.4	30X35
	330	603	483	1.6	25X50
		603	483	1.6	35X30
	390	511	409	1.7	30X40
		511	409	1.8	35X35
	470	424	339	2	30X45
		424	339	2	35X40
	560	356	285	2.3	35X45
	680	293	535	2.6	35X50
820	243	195	2.8	35X60	
400 (450) 2G	150	1327	1062	0.89	25X30
	180	1106	885	1	22X40
		1106	885	1	25X30
	220	905	724	1.1	22X45
		905	724	1.2	25X40
	270	737	590	1.3	25X45
		737	590	1.5	30X30
	330	603	483	1.6	22X50
		603	483	1.6	25X45
		603	483	1.7	30X35
	390	511	409	1.8	25X45
		511	409	1.8	35X30
		511	409	1.9	30X40
	470	424	339	2.1	35X35
	560	356	285	2.3	35X40
	680	293	235	2.7	35X45
	820	242	194	3.1	35X50
	1000	133	107	3.7	35X60
1200	166	89	4.2	40X60	
1500	133	71	5	40X70	
1800	111	59	5.8	40X80	
420 (470) 2X	120	1658	1327	0.82	25X30
	150	1327	1062	0.96	25X30
	180	1106	885	1.1	25X35
		1106	885	1.2	30X30
	220	905	724	1.2	25X40
		905	724	1.3	30X30
	270	737	590	1.3	25X45
		737	590	1.4	30X30
	330	603	483	1.7	30X40

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)
420 (470) 2X	390	511	409	1.8	30X45
		511	409	1.9	35X35
	470	424	339	2.0	30X45
		424	339	2.2	35X40
	560	356	285	2.4	35X45
	680	293	235	2.8	35X50
	820	242	194	3.2	35X60
	1000	133	107	4	40X60
	120	1658	1327	0.83	25X30
	150	1327	1062	0.95	22X45
1327		1062	0.95	25X35	
450 (500) 2W	180	1106	885	1.1	25X40
	180	1106	885	1.1	30X30
		905	724	1.2	22X50
	220	905	724	1.2	25X40
		905	724	1.2	30X30
	270	737	590	1.4	30X30
	330	603	480	1.6	30X40
	390	511	409	1.7	30X40
	390	511	409	1.8	35X35
		470	424	339	2.1
	560	356	285	2.3	35X45
	680	293	235	2.7	35X50
	820	242	194	3.2	35X60
	1000	133	107	4.2	35X70
	1200	166	89	4.4	40X70
	1500	133	71	5.2	40X80
	1800	111	59	6.3	40X100
	500 (550) 2H	100	1990	1592	0.75
120		1658	1327	0.83	25X30
150		1327	1062	0.95	30X30
180		1106	885	1.1	25X40
		1106	885	1.1	30X30
220		905	724	1.3	25X45
		905	724	1.3	30X35
270		737	590	1.5	30X40
330		603	483	1.6	35X35
390		511	409	1.9	35X40
470	424	339	2.2	35X45	
560	356	285	2.4	35X50	
680	293	235	2.7	35X50	

## Frequency Coefficient

Voltage (V)	Frequency					
	50/60Hz	120Hz	300Hz	1kHz	10kHz	≥50kHz
≤ 50	0.88	1.00	1.07	1.15	1.15	1.15
63 ~ 100	0.80	1.00	1.17	1.32	1.45	1.50
> 160	0.80	1.00	1.16	1.30	1.41	1.43

## Temperature Coefficient

Rated Voltage(V)	Temperature(°C)			
	+40	+55	+70	+85
< 160	2.1	1.8	1.5	1.0
≥ 160	1.7	1.5	1.3	1.0

## Lifetime Diagram

