

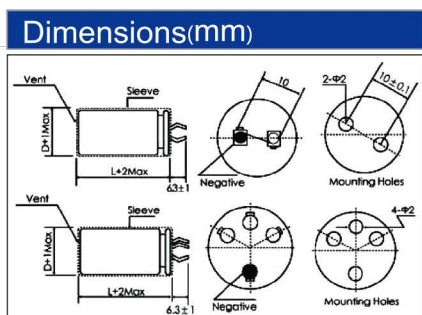
CD296 Series

- Long life snap-in series
- Endurance: 5000 hours at 105°C
- Applicable to SMP and frequency converters
- Sleeve color: Gold Print in Black Sleeve



Item	Characteristics																																									
Operating Temperature Range(°C)	-40~+105						-25~+105																																			
Voltage Range(V)	10~100						160~450																																			
Capacitance Range (μF)	68~56000																																									
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 0.01 CV or 1.5mA,whichever is smaller. C:Nominal Capacitance (μF) V:Rated Voltage (V)																																									
Dissipation Factor (20°C,120Hz)	<table><tr><td>Rated Voltage (V)</td><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>160~250</td><td>315~400</td><td>450</td></tr><tr><td>Tanδ(max)</td><td>0.55</td><td>0.50</td><td>0.45</td><td>0.40</td><td>0.35</td><td>0.30</td><td>0.25</td><td>0.20</td><td>0.15</td><td>0.20</td><td>0.25</td></tr></table>												Rated Voltage (V)	10	16	25	35	50	63	80	100	160~250	315~400	450	Tanδ(max)	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.20	0.25						
Rated Voltage (V)	10	16	25	35	50	63	80	100	160~250	315~400	450																															
Tanδ(max)	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.20	0.25																															
Stability at Low Temperature (Impedance Ratio at 120Hz)	<table><tr><td>Rated Voltage (V)</td><td colspan="3">10~100</td><td colspan="3">160~250</td><td colspan="3">350~450</td></tr><tr><td>Z -25°C / Z +20°C</td><td colspan="3">4</td><td colspan="3">3</td><td colspan="3">8</td></tr><tr><td>Z -40°C/Z +20°C</td><td colspan="3">15</td><td colspan="3">-</td><td colspan="3">-</td></tr></table>												Rated Voltage (V)	10~100			160~250			350~450			Z -25°C / Z +20°C	4			3			8			Z -40°C/Z +20°C	15			-			-		
Rated Voltage (V)	10~100			160~250			350~450																																			
Z -25°C / Z +20°C	4			3			8																																			
Z -40°C/Z +20°C	15			-			-																																			

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	7000h	>200000h	5000h	5000h	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 ±20% of initial value	Within ±20% of initial value	Within ±20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature Failure Rate Level	U _R I _R 105°C ≤1% Failure Rate	U _R 1.6×I _R 40°C ≤1% Failure Rate	U _R I _R 105°C guaranteed	U _R I _R =0 105°C	U _R =0 I _R =0 105°C After test: U _R to be applied for 30min >24h before measurement



Frequency Coefficient		Freq.(HZ)				
Voltage(V)		50Hz	120Hz	500Hz	1kHz	≥10kHz
10~100		0.90	1.00	1.05	1.10	1.15
160~250		0.80	1.00	1.20	1.30	1.50
315~450		0.80	1.00	1.20	1.25	1.40

CD296 Series

Ratings					
V _{DC} (Surge Voltage)	Rated Capacitance	Max. ESR 20°C, 120Hz	Typ. ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size φ DxL
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)
10 (13)	8200	89	62	1.36	22×25
	1000	73	51	1.65	22×30
	12000	61	43	1.85	22×35
		61	43	1.82	25×25
	15000	49	34	2.12	22×40
		49	34	2.11	25×30
		49	34	2.14	30×25
	18000	41	28	2.4	22×45
		41	28	2.32	25×35
	22000	33	23	2.59	25×40
		33	23	2.73	30×30
	27000	27	19	3.01	25×45
		27	19	3.13	30×35
		27	19	3.05	35×30
	33000	22	16	3.43	25×50
		22	16	3.53	30×40
		22	16	3.49	35×35
	39000	19	13	3.78	30×45
		19	13	3.96	35×40
	47000	16	11	4.58	30×50
16 (20)	56000	13	9	5.06	35×50
	5600	119	83	1.44	22×25
	6800	98	68	1.66	22×30
	8200	81	57	1.67	25×25
	10000	66	46	2.08	22×35
		66	46	2.07	25×30
	12000	55	39	2.36	22×40
		55	39	2.37	25×35
	15000	55	39	2.33	30×25
		44	31	2.69	22×45
		44	31	2.72	25×40
	18000	44	31	2.54	30×30
		37	26	3.06	25×45
		37	26	3.02	30×35
	22000	37	26	3.09	35×30
		30	21	3.39	25×50
	27000	30	21	3.46	30×40
		25	17	3.88	30×45
	33000	25	17	3.85	35×35
		20	14	4.33	30×50
25 (32)	39000	20	14	4.33	35×40
	47000	17	12	4.96	35×45
	3900	14	10	5.49	35×50
		153	107	1.31	22×25
	4700	127	89	1.55	22×30
		107	75	1.77	22×35
	5600	107	75	1.76	25×25
		88	62	2.02	22×40
	6800	88	62	1.88	25×30
		73	51	2.27	22×45
	8200	73	51	2.18	25×35
		73	51	2.19	30×25
	10000	60	42	2.56	22×50
		60	42	2.53	25×40
		60	42	2.38	30×30
	12000	50	35	2.79	25×45
		50	35	2.7	30×35
	15000	50	35	2.76	35×30
		40	28	3.13	30×40
	18000	33	23	3.52	30×45
		33	23	3.5	35×35
	22000	27	19	3.92	30×50
	27000	27	19	3.95	35×40
		22	16	4.72	35×50

Ratings					
V _{DC} (Surge Voltage)	Rated Capacitance	Max. ESR 20°C, 120Hz	Typ. ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size φ DxL
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)
35 (44)	2700	197	138	1.29	22×25
	3300	161	113	1.54	22×30
	3900	136	95	1.77	22×35
		136	95	1.75	25×25
	4700	113	79	2.01	22×40
		113	79	1.97	25×30
		95	66	2.25	22×45
	5600	95	66	2.18	25×35
		95	66	2.08	30×25
	6800	78	55	2.49	22×50
		78	55	2.45	25×40
		78	55	2.28	30×30
	8200	65	45	2.8	25×45
		65	45	2.69	30×35
	10000	53	37	3.04	30×40
		53	37	2.78	35×30
	12000	44	31	3.38	30×45
		44	31	3.3	35×35
	15000	35	25	3.38	35×40
	18000	30	21	4.4	35×45
50 (63)	1500	310	217	1.21	22×25
	2200	211	148	1.52	22×30
		211	148	1.46	25×25
	2700	172	120	1.77	22×35
		172	120	1.76	25×30
	3300	141	99	1.92	22×40
		141	99	1.92	30×25
	3900	119	83	2.27	22×45
		119	83	2.2	25×35
		119	83	2.19	30×30
	4700	99	69	2.43	25×40
		83	58	2.72	25×45
	5600	83	58	2.58	30×35
		83	58	2.35	35×30
	6800	68	48	3.01	30×40
		68	48	2.91	35×35
	8200	57	40	3.63	30×50
		57	40	3.36	35×40
	10000	46	33	3.79	35×45
	12000	39	27	4.06	35×50
	1000	398	279	1.1	22×25
63 (79)	1500	265	186	1.41	22×30
	1800	265	186	1.38	25×25
		221	155	1.62	22×35
	2200	221	155	1.63	25×30
		181	127	1.85	22×40
	2700	181	127	1.80	30×25
		147	103	2.1	22×45
	3300	147	103	2.03	25×35
		147	103	2.01	30×30
	3900	121	84	2.33	25×40
		102	72	2.58	25×45
	4700	102	72	2.46	30×35
		102	72	2.31	35×30
	5600	85	59	2.82	30×40
		85	59	2.77	35×35
	6800	71	50	3.22	30×45
		71	50	3.2	35×40
	8200	59	41	3.61	35×45
	8200	49	34	3.94	35×50
80 (100)	820	405	283	1.09	22×25
	1000	332	232	1.29	22×30
	1200	277	194	1.48	22×35
		277	194	1.38	25×25
	1500	221	155	1.7	22×40
		221	155	1.74	25×30
		221	155	1.75	30×25
	1800	184	129	1.91	22×45
		184	129	1.86	25×35
	2200	151	106	2.22	25×45
		151	106	2.02	30×30
	2700	123	86	2.38	30×35
		123	86	2.45	35×30
	3300	101	70	2.69	30×40
		101	70	2.6	35×35
	3900	85	60	2.94	30×45
		85	60	3	35×40
	4700	71	49	3.44	35×45
	5600	59	42	3.72	35×50

CD296 Series

Ratings					
V _{DC} (Surge Voltage)	Rated Capacitance	Max. ESR 20°C, 120Hz	Typ. ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size φ D×L
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)
100 (125)	560	474	332	1.01	22×25
	680	390	273	1.19	22×30
	820	324	227	1.33	22×35
	324	227	1.26	25×25	
	265	186	1.56	22×40	
	265	186	1.52	25×30	
	265	186	1.47	30×25	
	221	155	1.76	22×45	
	221	155	1.76	25×35	
	221	155	1.76	30×30	
	177	124	2	22×50	
	177	124	2.03	25×40	
	147	103	2.29	25×45	
	147	103	2.19	30×35	
	147	103	2.15	35×30	
	121	84	2.52	30×40	
	121	84	2.48	35×35	
	98	69	2.86	30×45	
	98	69	2.87	35×40	
	80	56	3.25	35×45	
160 (200)	3900	68	48	3.56	35×50
	220	905	633	0.63	22×25
	270	737	516	0.76	22×30
	330	603	422	0.9	22×35
	603	422	0.84	25×25	
	510	357	0.97	25×30	
	510	357	1	30×25	
	424	296	1.11	22×40	
	424	296	1.14	25×35	
	424	296	1.17	30×30	
	560	355	249	1.26	22×45
	293	205	1.44	22×50	
	293	205	1.43	25×40	
	293	205	1.5	30×35	
	243	170	1.63	25×45	
	243	170	1.66	30×40	
	243	170	1.63	35×30	
	199	139	1.89	30×45	
	199	139	1.89	35×35	
	166	116	2.16	30×50	
180 (225)	166	116	2.23	35×40	
	133	93	2.61	35×45	
	1800	111	77	2.97	35×50
	220	905	633	0.63	22×25
	737	516	0.76	22×30	
	737	516	0.76	25×25	
	603	422	0.9	22×35	
	603	422	0.9	25×30	
	510	357	1.03	22×40	
	510	357	1.06	25×35	
	510	357	1.02	30×25	
	424	296	1.17	22×45	
	424	296	1.17	30×30	
	355	249	1.32	22×50	
	355	249	1.32	25×40	
	355	249	1.33	30×35	
	293	205	1.51	25×45	
	293	205	1.49	35×30	
	243	170	1.71	25×50	
1000	243	170	1.74	30×40	
	243	170	1.75	35×35	
	199	139	2.01	30×45	
	199	139	2.07	35×40	
	166	116	2.25	30×50	
	166	116	2.23	35×45	
	133	93	2.76	35×50	

Ratings					
V _{DC} (Surge Voltage)	Rated Capacitance	Max. ESR 20°C, 120Hz	Typ. ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size φ D×L
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)
200 (250)	180	1106	774	0.57	22×25
	220	905	633	0.7	22×30
	737	516	0.83	22×35	
	737	516	0.76	25×25	
	603	422	0.96	22×40	
	603	422	0.9	25×30	
	510	357	1.06	25×35	
	510	357	1.02	30×25	
	424	296	1.17	22×45	
	424	296	1.22	25×40	
	424	296	1.17	30×30	
	355	249	1.39	25×45	
	355	249	1.38	30×35	
	293	205	1.58	25×50	
	293	205	1.61	30×40	
	293	205	1.49	35×30	
	243	170	1.85	30×45	
	243	170	1.75	35×35	
	199	139	2.11	30×50	
	199	139	2.07	35×40	
250 (300)	1200	166	116	2.38	35×45
	1500	133	93	2.76	35×50
	150	1327	929	0.52	22×25
	180	1106	774	0.64	22×30
	1106	774	0.62	25×25	
	905	633	0.76	22×35	
	905	633	0.76	25×30	
	737	516	0.88	22×40	
	737	516	0.9	25×35	
	737	516	0.85	30×25	
	603	422	1.01	22×45	
	603	422	1	30×30	
	510	357	1.13	22×50	
	510	357	1.13	25×40	
	510	357	1.15	30×35	
	424	296	1.29	25×45	
	424	296	1.24	35×30	
	355	249	1.45	25×50	
	355	249	1.48	30×40	
	355	249	1.49	35×35	
315 (365)	680	293	205	1.71	30×45
	293	205	1.74	35×40	
	820	243	170	1.94	30×50
	1000	199	139	2.2	35×45
	68	3903	2732	0.32	22×25
	82	3237	2266	0.38	22×30
	100	2654	1858	0.41	25×25
	120	2212	1548	0.48	22×35
	2212	1548	0.49	25×30	
	1769	1239	0.56	22×40	
	1769	1239	0.51	30×25	
	1474	1032	0.63	22×45	
	1474	1032	0.62	25×35	
	1474	1032	0.63	30×30	
	1206	844	0.72	22×50	
	1206	844	0.71	25×40	
	1206	844	0.74	30×35	
	983	688	0.81	25×45	
	983	688	0.85	30×40	
	983	688	0.82	35×30	

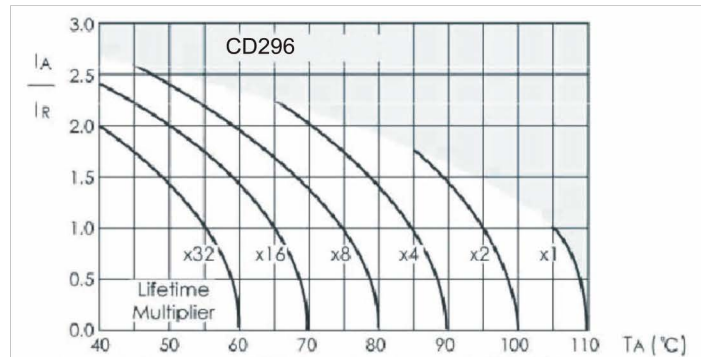
CD296 Series

Ratings					
V _{DC} (Surge Voltage)	Rated Capacitance	Max. ESR 20°C, 120Hz	Typ. ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size φDxL
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)
315 (365)	330	804	563	0.92	25×50
		804	563	0.9	35×35
	390	681	476	1.04	30×45
		681	476	1.05	35×40
	470	565	395	1.15	30×50
		565	395	1.18	35×45
350 (400)	560	474	332	1.34	35×50
	68	3903	2732	0.34	22×25
		82	3237	0.4	22×30
		100	2654	0.47	25×25
	120	2212	1548	0.52	22×35
		2212	1548	0.53	25×30
		2212	1548	0.53	30×25
	150	1769	1239	0.59	22×40
		1769	1239	0.6	25×35
	180	1474	1032	0.68	22×45
		1474	1032	0.7	25×40
		1474	1032	0.71	30×30
	220	1206	844	0.78	22×50
		1206	844	0.82	25×45
		1206	844	0.82	30×35
	270	983	688	0.94	25×50
		983	688	0.93	30×40
		983	688	0.9	35×30
	330	804	563	1.05	30×45
		804	563	1.01	35×35
	390	681	476	1.18	30×50
		681	476	1.13	35×40
	470	565	395	1.26	35×45
	560	474	332	1.39	35×50
400 (450)	68	3903	2732	0.38	22×30
	82	3237	2266	0.41	25×25
	100	2654	1858	0.46	22×35
		2654	1858	0.48	25×30
		2654	1858	0.48	30×25
	120	2212	1548	0.53	22×40
		2212	1548	0.55	25×35
		2212	1548	0.56	30×30
	150	1769	1239	0.63	22×50
		1769	1239	0.65	25×40
	180	1474	1032	0.72	25×45
		1474	1032	0.74	30×35
	220	1206	844	0.79	25×50
		1206	844	0.85	30×40
		1206	844	0.89	35×30
	270	983	688	0.98	30×45
		983	688	0.96	35×35
	330	804	563	1.12	30×50
		804	563	1.12	35×40
	390	681	476	1.27	35×45
	470	565	395	1.33	35×50

Ratings					
V _{DC} (Surge Voltage)	Rated Capacitance	Max. ESR 20°C, 120Hz	Typ. ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size φDxL
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)
450 (500)	68	3903	2732	0.38	22×30
	82	3237	2266	0.44	22×35
		3237	2266	0.45	25×30
		3237	2266	0.46	30×25
	100	2654	1858	0.5	22×40
		2654	1858	0.52	25×35
	120	2212	1548	0.58	22×50
		2212	1548	0.58	25×40
		2212	1548	0.58	30×30
	150	1769	1239	0.66	25×45
		1769	1239	0.68	30×35
		1474	1032	0.74	25×50
	180	1474	1032	0.77	30×40
		1474	1032	0.77	35×30
		1206	844	0.88	30×45
	220	1206	844	0.88	35×35
		983	688	0.99	30×50
	270	983	688	1.01	35×40
		804	563	1.15	35×45
	330	804	563	1.15	35×45
	390	681	476	1.28	35×50

Customer products are available on request.

Lifetime Diagram



I_A=actual ripple current at 120Hz, I_R=rated ripple current at 120Hz, 105°C
Multiplier of Useful Life as a function of ambient temperature and ripple current load