

CD288 Series

Radial Aluminium Electrolytic Capacitors (Low Impedance)

Features

- Small size, standard series
- Low impedance
- Suitable for switching power supply outputs



TEMPERATURE RANGE
-40 / -25°C ... +105°C

RATED VOLTAGE
6.3 – 450 V

CAPACITANCE
4.7 – 4700 µF

ENDURANCE
105°C 2000 h

Temperature range: -40°C ... +105°C for 6.3 ~ 100 V; -25°C ... +105°C for 160 ~ 450 V.

Specifications

Operating temperature range	6.3 ~ 100 V: -40 ~ +105°C 160 ~ 450 V: -25 ~ +105°C	
Rated voltage range	6.3 ~ 100 V DC 160 ~ 450 V DC	
Nominal capacitance range	4.7 ~ 4700 µF	
Capacitance tolerance	±20% (25°C, 120 Hz)	
Leakage current	6.3 ~ 100 V: $I \leq 0.01 \text{ CR} \cdot \text{UR}$ or $3 \mu\text{A}$, whichever is greater (after 2 minutes) 160 ~ 450 V: $I \leq 0.03 \text{ CR} \cdot \text{UR} + 10 \mu\text{A}$ (after 2 minutes) where CR = rated capacitance (µF) and UR = rated voltage (V)	
Load life	After applying rated voltage with the specified ripple current for 2000 hours at +105°C, then recovered for 16 hours.	
	Capacitance change	Within +20% of the initial measured value
	Leakage current	Not more than the initial specified value
	Dissipation factor	Not more than 150% of the initial specified value
Shelf life	After storage for 1000 hours at +85°C, then recovered for 16 hours.	
	Capacitance change	Within +20% of the initial measured value
	Leakage current	Not more than 200% of the initial specified value
	Dissipation factor	Not more than 120% of the initial specified value

Low-temperature characteristics

Rated voltage (V)	6.3	10	16	25	35	50	63	100	160	250	400	450
Z(-25°C)/Z(+20°C)	4	3	2	2	2	2	2	2	7	5	5	4
Z(-40°C)/Z(+20°C)	8	6	4	3	3	3	3	3	—	—	—	—

Impedance ratio at 120 Hz. For capacitance above 1000 µF, add 1 to the ratio for every additional 1000 µF. Z(-40°C)/Z(+20°C) is not specified for 160 ~ 450 V.

Dissipation factor (tan δ) at 25°C, 120 Hz

Rated voltage (V)	6.3	10	16	25	35	50	63	100	160	400 ~ 450
tan δ	0.22	0.18	0.16	0.14	0.12	0.10	0.09	0.08	0.15	0.2

For capacitance above 1000 µF, add 0.02 for every additional 1000 µF.

Standard ratings

$\mu\text{F} \setminus \text{V}$	6.3	10	16	25	35	50	100	160	200	250	350	400	450
1						5x11							
2.2											10x17	10x17	10x17
3.3											10x17	10x20	10x20
4.7					5x11	5x11	6x11				10x20	10x25	13x25
6.8						5x11							
10					5x11	5x11	6.3x11			10x20	13x20	13x25	16x25
22					5x11	5x11	8x12	10x20	10x20	13x25	16x25	16x25	16x30
33					5x11	6.3x12	10x20	13x20	13x20	13x25	16x30	16x30	18x30
47			5x11	5x11		6.3x12	10x20	13x25	13x25	16x25	18x30	18x30	18x35
100		5x11	6.3x12	6.3x11	8x12	8x12	10x25	16x25	16x25	16x30	18x45	18x35	
220		6.3x11	6.3x11	8x12	10x12	10x17	12x35	18x35	16x30	18x35	18x55		
330	6.3x12	8x12	8x12	10x16	10x20	10x25	16x30						
470	8x12	8x12	8x12	10x12	10x25	13x20	16x40	18x40	18x50				
680			8x16	10x16	13x20								
1000	8x16	8x16	10x20	13x20	13x20	16x25							
1200		8x16											
1500	8x20	10x16	10x20										
2200	10x20	13x20	13x20	13x26									
2700	10x24												
3300	13x21	13x25	13x25										
4700	13x30												

Case size $\Phi D \times L$ (mm). Full ratings in the characteristics list.

How to order

CD288 Series code	2 Number of characters for capacitance $47\mu\text{F} = 2, 470\mu\text{F} = 3, 4700\mu\text{F} = 4$	470 Capacitance $47\mu\text{F} = 470, 3300\mu\text{F} = 332, 33000\mu\text{F} = 333$	M Capacitance tolerance $M = \pm 20\%, K = \pm 10\%$	630 Voltage code $6.3\text{V} = 6R3, 10\text{V} = 100, 63\text{V} = 630, 100\text{V} = 101$	B Package B: bulk pack, A: ammo pack	8X12 Size code
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Example: CD2882470M630B8X12

Environmental

RoHS declaration (6/6) complies with the requirements of Directive 2002/95/EC, which stipulates the use of 100% Sn solder, gold plated or non-magnetic 100% Sn solder

RoHS

REACH

Applications

Computer

PC power

Measuring instruments

Telecom infrastructure

Characteristics list

Rated voltage (V)	Capacitance (μF)	Case size $\Phi D \times L$ (mm)	Ripple current (mA, 100 kHz, 105°C)	ESR (Ω , 100 kHz, 20°C)
6.3	330	6.3x12	250	0.25
6.3	470	8x12	480	0.14
6.3	1000	8x16	800	0.1
6.3	1500	8x20	1708	0.084
6.3	2200	10x20	1500	0.042
6.3	2700	10x24	2226	0.051
6.3	3300	13x21	1850	0.038
6.3	4700	13x30	2500	0.025
10	100	5x11	170	0.42
10	220	6.3x11	260	0.22
10	330	8x12	400	0.14
10	470	8x12	600	0.1
10	1000	8x16	1150	0.068
10	1200	8x16	1150	0.068
10	1500	10x16	1150	0.09
10	2200	13x20	1900	0.038
10	3300	13x25	1850	0.05
16	47	5x11	150	0.5
16	100	6.3x12	250	0.25
16	220	6.3x11	400	0.14

Rated voltage (V)	Capacitance (μF)	Case size ΦD×L (mm)	Ripple current (mA, 100 kHz, 105°C)	ESR (Ω, 100 kHz, 20°C)
16	330	8×12	560	0.1
16	470	8×12	950	0.085
16	680	8×16	800	0.08
16	1000	10×20	1400	0.046
16	1500	10×20	1470	0.05
16	2200	13×20	2100	0.03
16	3300	13×25	2820	0.03
25	47	5×11	170	0.42
25	100	6.3×11	310	0.22
25	220	8×12	560	0.13
25	330	10×16	800	0.069
25	470	10×12	1200	0.068
25	680	10×16	1300	0.065
25	1000	13×20	1850	0.038
25	2200	13×26	2850	0.022
35	4.7	5×11	100	1.2
35	10	5×11	120	0.9
35	22	5×11	170	0.42
35	33	5×11	180	0.42
35	47	—	200	0.36
35	100	8×12	400	0.14
35	220	10×12	800	0.095
35	330	10×20	1200	0.08
35	470	10×25	1400	0.07
35	680	13×20	2324	0.06
35	1000	13×20	2150	0.055
50	1	5×11	40	4
50	4.7	5×11	85	2
50	6.8	5×11	110	1.9
50	10	5×11	100	1.7
50	22	5×11	150	0.7
50	33	6.3×12	250	0.42
50	47	6.3×12	250	0.42
50	100	8×12	500	0.2
50	220	10×17	950	0.1
50	330	10×25	1250	0.067
50	470	13×20	1450	0.055
50	1000	16×25	2300	0.026
100	4.7	6×11	115	3
100	10	6.3×11	170	2
100	22	8×12	280	0.9
100	33	10×20	473	0.4
100	47	10×20	473	0.4
100	100	10×25	875	0.2
100	220	12×35	1550	0.1
100	330	16×30	1920	0.067
100	470	16×40	2220	0.055
160	22	10×20	350	1
160	33	13×20	450	0.9
160	47	13×25	600	0.81
160	100	16×25	950	0.35
160	220	18×35	1300	0.28
160	470	18×40	1600	0.24
200	22	10×20	350	1.2
200	33	13×20	520	0.78
200	47	13×25	600	0.7
200	100	16×25	950	0.27
200	220	16×30	1350	0.2
200	470	18×50	1690	0.12
250	10	10×20	220	2.8
250	22	13×25	300	2
250	33	13×25	400	1.4

Rated voltage (V)	Capacitance (μF)	Case size ΦD×L (mm)	Ripple current (mA, 100 kHz, 105°C)	ESR (Ω, 100 kHz, 20°C)
250	47	16×25	720	0.9
250	100	16×30	980	0.56
250	220	18×35	1360	0.28
350	2.2	10×17	50	3.5
350	3.3	10×17	60	3.4
350	4.7	10×20	78	2.8
350	10	13×20	130	1.5
350	22	16×25	250	0.8
350	33	16×30	480	0.7
350	47	18×30	710	0.5
350	100	18×45	1050	0.4
350	220	18×55	1400	0.3
400	2.2	10×17	140	4.4
400	3.3	10×20	195	2.8
400	4.7	10×25	220	2.4
400	10	13×25	360	1.3
400	22	16×25	570	0.6
400	33	16×30	700	0.5
400	47	18×30	860	0.4
400	100	18×35	1150	0.34
450	2.2	10×17	110	7.2
450	3.3	10×20	135	5.8
450	4.7	13×25	190	3.5
450	10	16×25	250	2.2
450	22	16×30	480	0.8
450	33	18×30	650	0.5
450	47	18×35	850	0.6

The specifications give a capacitance range of 4.7 ~ 4700 μF, but the ratings table also lists 1 μF (50 V), 2.2 μF and 3.3 μF (350 ~ 450 V) — subject to manufacturer confirmation.

35 V / 47 μF: the case size is not printed on the original sheet — subject to manufacturer confirmation.

Load life and shelf life: the capacitance change is printed as '+20%' on the original sheet (no ± sign) — subject to manufacturer confirmation.

Column headings: the original sheet heads these columns 'Ripple Current at 100KHz 105°C most(mA)' and 'ESR(Ω) 100KHz, 20°C' on page 1 and 'Z' / 'ESR(Q)' on the ratings pages; whether the ripple values are maximum ratings is not stated — subject to manufacturer confirmation.

The ordering example specifies 47 μF / 63 V with size code 8X12. The original specification tables mention 63 V, but the original ratings tables contain no 63 V column; the case size, ripple current and ESR for this example cannot be verified from those tables — subject to manufacturer confirmation.