



FILM CAPACITORS · DC LINK

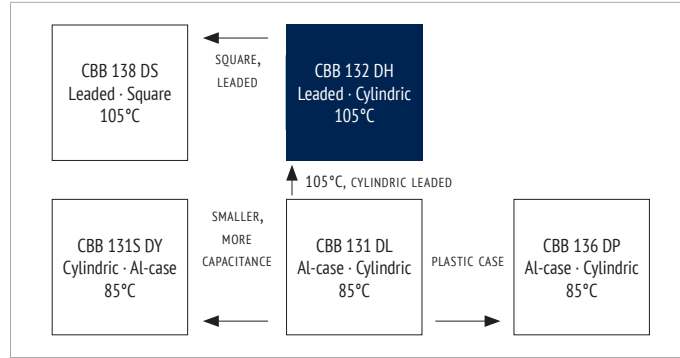
CBB 132 DH SERIES



FEATURES

- DC-Link
- 105°C Type
- High ripple current capability
- Self-healing
- Long lifetime
- Plastic case
- Soldering Style

OVERVIEW



PRODUCT



APPLICATIONS

- High power frequency converters
- Motion control, welding equipment, elevators
- Photovoltaic and wind inverters

CHARACTERISTICS

ITEM	CHARACTERISTICS
Climatic Category	40/105/56 (IEC 61071)
Operating Temperature	-40 ~ +105 °C ($\theta_{hotspot} \leq 105$ °C) $\theta_{hotspot} = 85-105$ °C; See Voltage Derating Diagram
Storage Temperature	-40 ~ +105 °C
Rated Voltage U_{RDC}	600 ~ 1 200 V_{DC}
Capacitance Range	25 ~ 145 μF
Capacitance Tolerance	± 10 % (K), ± 5 % (J)
Voltage between Terminals U_{TT}	$1,5 \cdot U_{RDC}$ (20°C, 10s)
Voltage between Terminals & Case U_{TC}	$\geq 3\ 000 V_{AC}$ (20°C, 50 Hz, 10s)
Max. Overvoltage	Please see IEC 61071
Insulation Resistance R_i °C	$\geq 5\ 000 M\Omega \cdot \mu F$ (20°C, 100 V_{DC} , 1 min)
Dielectric Dissipation Factor $\tan \delta_o$	$\leq 2 \cdot 10^{-4}$ (20°C, 100 Hz)
Life Time Expectancy	$\geq 100\ 000h$, failure rate ≤ 50 FIT ($\theta_{hotspot} \leq 70$ °C, U_{RDC})
Reference Standard	IEC 61071:2007

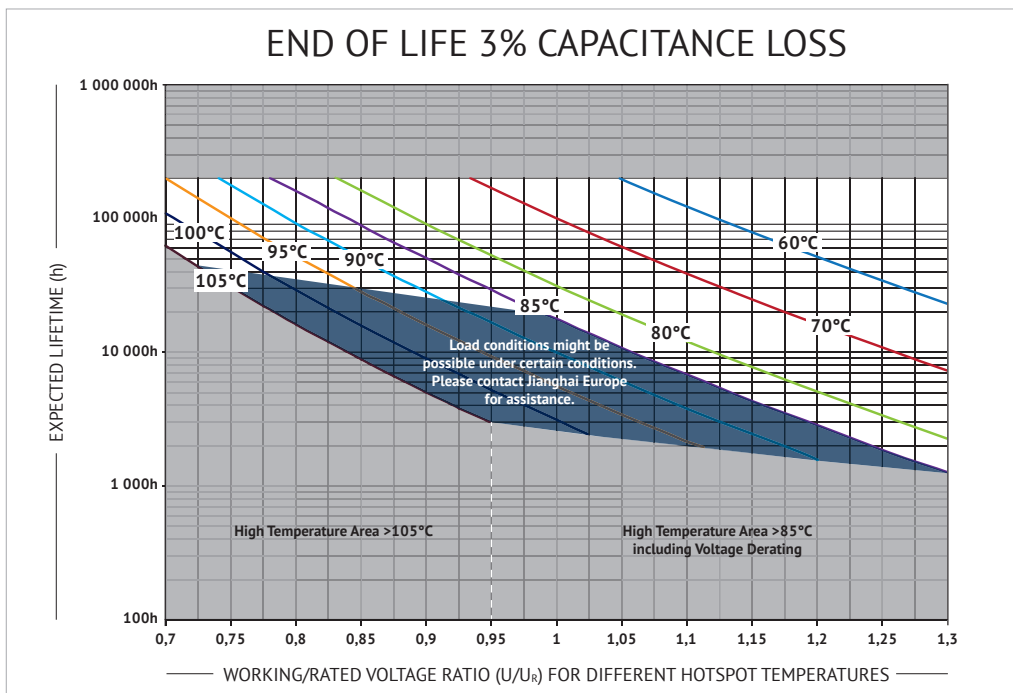
ENVIRONMENTAL

The products are RoHS, WEEE and REACH compliant.
The detailed version please see separate "Environmental Certificates" document or www.jianghai-europe.com

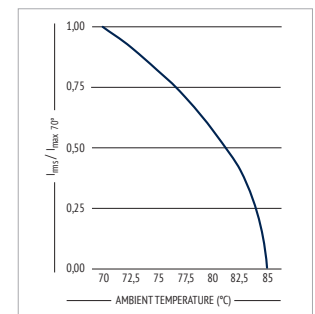
APPROVALS

- UL94-V0:**
Plastic & Compound Mass
- UL810:**
CZDS2.E227010 (Construction)

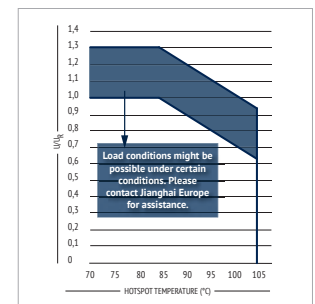
LIFETIME



CURRENT DERATING



VOLTAGE DERATING



DIMENSIONS

STYLE A
**NO SOCKET,
4 SOLDERING PINS**

STYLE B
**WITH SOCKET,
4 SOLDERING PINS**
W TYPICALLY 8MM+/-1MM
L2 TYPICALLY 1,5MM+/-1MM

in mm

INTERNAL CONSTRUCTION

NO.	ITEM	MATERIAL
1	Winding Core	PC
2	Metallized Film	PP + Al, Zn
3	Metal Sprayed Electrode	Zn + Sn/Zn

NO.	ITEM	MATERIAL
4	Terminals	Cu, Sn-plated
5	Potting Compound	Epoxy
6	Connection Electrode Case	Cu

MARKING

Jianghai
BRAND

CBB 132
PRODUCT SERIES

60µF J 800V
CAPACITANCE, TOLERANCE AND RATED VOLTAGE

J02F12
DATE CODE

ORDER CODE

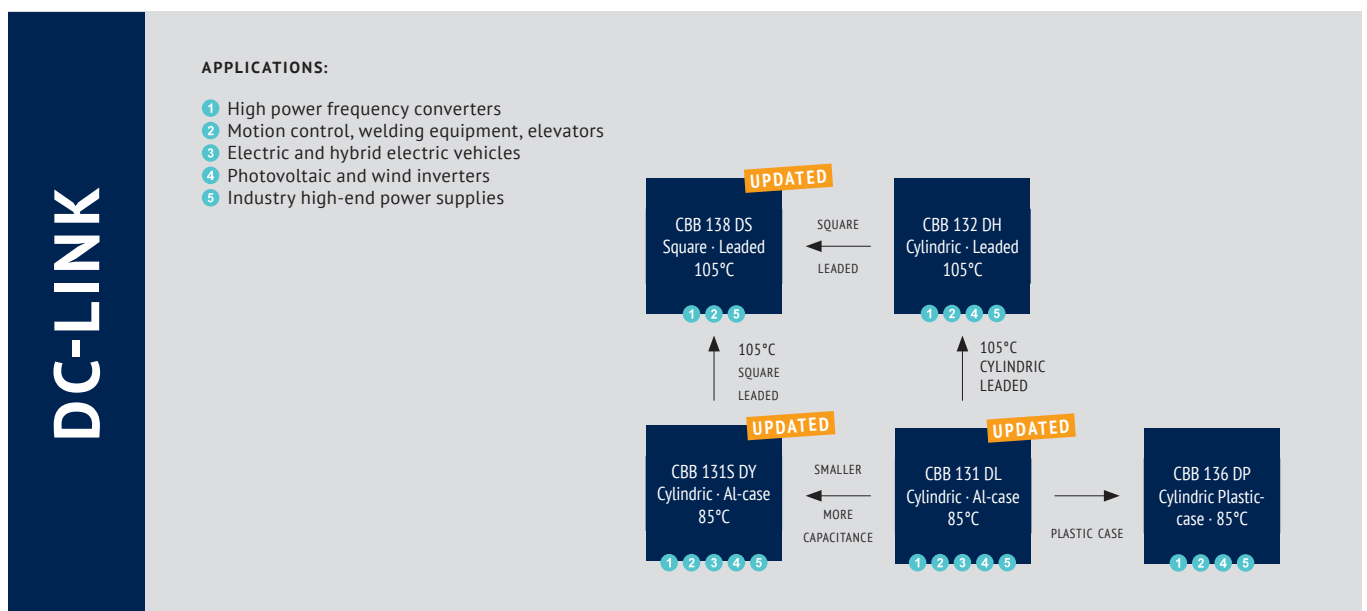
FC	C	3A	DH	117	K	K	061	W	4	A	E 3
Capacitor type	Product shape	DC rated voltage code (V)	Series code	Capacitance Code Examples (µF)	Capacitance tolerance	Diameter (mm)	Height L ₁ (mm)	Terminal style P2	Bottom Bolt	Style	For internal use
Film Cap. = FC	cylindrical = C	600 2S 800 2K 1000 3A 1200 3B	CBB 132 = DH	50 506 75 756 80 806 110 117 120 127 145 157 200 207 220 227	±5% J ±10% K	50 D 56,3 C 63,5 E 35,9 X	59,0 059 61,3 061 70,6 071	12,7 W	M8*10 4 without 0	A A B B	

RATINGS

U _R ≤85°C (V _{DC})	C _R (µF)	I _{max} 70°C 10kHz (A)	f̂ ⁽¹⁾ (A)	ESR _{typ} 20°C, 1kHz (mΩ)	R _{th} ⁽²⁾ (K/W)	dV/dt 20°C (V/µs)	D (mm)	L (mm)	L ₁ (mm)	P ₁ (mm)	P ₂ (mm)	ORDER CODE
600 2S	30	12,4	847	8,0	8,1	28	35,9	53,7	61,3	5,4	12,7	FCC2SDH306#X061W##E3
	110	25	1650	3,5	4,6	15	50,0	63,0	70,6	5,1	12,7	FCCS2SDH117#D071W##E3
	145	35	2175	2,8	2,9	15	56,3	63,0	70,6	5,1	12,7	FCCS2SDH157#C071W##E3
		35	2900	2,5	3,3	20	63,5	51,4	59,0	5,1	12,7	FCCS2SDH157#E059W##E3
800 2K	60	16	900	5,0	7,8	15	50,0	63,0	70,6	5,1	12,7	FCC2KDH606#D071W##E3
	90	20	1350	4,0	6,3	15	56,3	63,0	70,6	5,1	12,7	FCC2KDH906#C071W##E3
		20	1800	3,0	8,3	20	63,5	51,4	59,0	5,1	12,7	FCC2KDH906#E059W##E3
1000 3A	45	15	675	6,0	7,4	15	50,0	63,0	70,6	5,1	12,7	FCCS3ADH456#D071W##E3
	60	18	900	5,0	6,2	15	56,3	63,0	70,6	5,1	12,7	FCCS3ADH606#C071W##E3
		18	1200	4,5	6,9	20	63,5	51,4	59,0	5,1	12,7	FCCS3ADH606#E059W##E3
1200 3B	25	10	500	8,9	11,2	20	50,0	63,0	70,6	5,1	12,7	FCCS3BDH256#D071W##E3
	35	15	700	6,0	7,4	20	56,3	63,0	70,6	5,1	12,7	FCCS3BDH356#C071W##E3
		15	875	5,5	8,1	25	63,5	51,4	59,0	5,1	12,7	FCCS3BDH356#E059W##E3

(1) Maximum permissible peak current, (2) Thermal resistance from hotspot to ambient (free convection)

DC LINK OVERVIEW

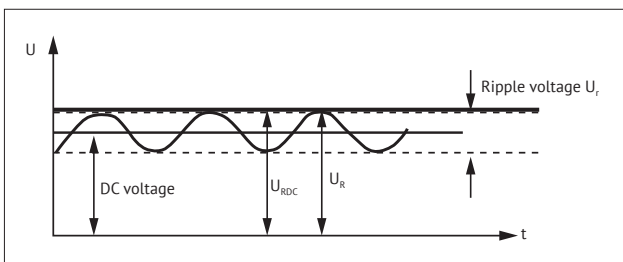


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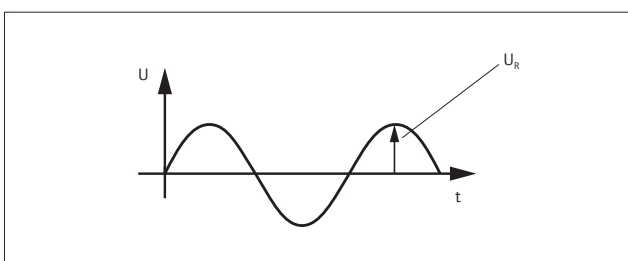
NOMINAL CAPACITANCE C_R Nominal Capacitance is defined at 20°C and 50Hz (120Hz).

RATED VOLTAGE U_R

DC Capacitors: U_{RDC} Maximum operating peak voltage of either polarity but of a non-reversing type waveform, for which the capacitor has been designed, for continuous operation. The maximum DC voltage is the sum of the DC voltage and peak AC voltage.



AC Capacitors: U_{RAC} Maximum operating peak recurrent voltage of either polarity of a reversing type waveform for which the capacitor has been designed.



OPERATING VOLTAGE The plastic film capacitor varies in the maximum applicable voltage depending on the applied voltage waveform, current waveform, frequency, ambient temperature (capacitor surface temperature), capacitance value, etc. Be sure to use capacitors within the specified values by checking the voltage waveform, current waveform, and frequency applied to them (In the application of high frequency, the permissible voltage varies with the type of the capacitor. Refer to the specification for details. See also Voltage Derating tables.).

NON-RECURRENT SURGE VOLTAGE U_s Peak voltage induced by a switching or any other disturbance of the system which is allowed for a limited number of times and for durations shorter than the basic period.

- Maximum duration: 50 ms / pulse
- Maximum number of occurrences: 1000 (during load)

MAXIMUM RATE OF VOLTAGE RISE dV/dt Maximum permissible repetitive rate of voltage rise of the operational voltage.

OPERATING CURRENT Due to the fact that the dissipation factor of the capacitor is greater than zero, heat will be generated in any application where alternating currents or pulses occur. The resulting internal temperature rise may cause a severe deterioration of the capacitor's withstanding voltage, or may lead to a breakdown (even smoke or fire may result). Therefore, the safe use of capacitor must be within the rated voltage (or category voltage) and the permissible current ranges. The rated current must be considered by dividing into pulse current (peak current) and continuous current (rms current) depending on the break down mode, and when using, should make sure the both currents are within the permissible range.

MAXIMUM CURRENT I_{MAX} Maximum Rms Current for continuous operation, see Current Derating tables.

MAXIMUM PEAK CURRENT \hat{I} Maximum permissible repetitive peak current which can occur during continuous operation.

$$\hat{I} = C_R * (dV/dt)$$

MAXIMUM SURGE CURRENT \hat{I}_s

- Maximum duration: 50 ms / pulse
- Maximum number of occurrences: 1000 (during load)

SERIES RESISTANCE R_s Effective ohmic resistance of the conducting elements of the capacitor.

EQUIVALENT SERIES RESISTANCE ESR The ESR represents all ohmic resistances: $ESR = \tan\delta/(\omega C) = R_s + \tan\delta/(\omega C)$

DIELECTRIC DISSIPATION FACTOR $\tan\delta$ Constant dissipation factor of the dielectric material.

LOSS FACTOR $\tan\delta$ The dissipation factor is the ratio between the reactive and effective power.

HOTSPOT TEMPERATURE $\Theta_{HOTSPOT}$ Temperature at the hottest position inside the capacitor. $\Theta_{hotspot} = \Theta_{ambient} + P_{loss} * R_{th}$

$$R_{th}: \text{thermal resistance, } P_{loss}: \text{Powerloss } P_{loss} = ESR * I_{rms}^2,$$

$\Theta_{ambient}$ = ambient temperature

CHARGING AND DISCHARGING Because the charging and discharging current of capacitor is obtained by the product of voltage rise rate (dV/dt) and capacitance, low voltage charging and discharging may also cause deterioration of capacitor such as

shorting and open due to sudden charging and discharging current. When charging and discharging, pass through a resistance of 20Ω/V to 1000Ω/V or more to limit the current. When connecting multiple film capacitors in parallel in withstand voltage test or life test, connect a resistance of 20Ω/V to 1000Ω/V or more in series to each capacitor. In addition, **capacitors must be discharged via a resistor before handling**. Because the capacitors do not have any discharge resistors built-in, there is a risk of residual voltages and electric energy contents that might be dangerous.

TEMPERATURE RANGE AND ALTITUDE Use film capacitors only within the specified operating temperature range. The altitude and barometric pressure have an impact on the functionality of the capacitor. Max. Altitude: 2000m above sea level.

ALTITUDE/m	CURRENT DERATING COEFFICIENT
≤ 2 000	1,00
2 500	0,95
3 000	0,90
3 500	0,85
4 000	0,80
4 500	0,75
5 000	0,70

EXPECTED LIFETIME The expected lifetime of the capacitor depends on the applied voltage and the hot spot temperature during operation. For capacitors applied in different situations, the obtainable average service lives are different. Please refer to the life time diagrams of each series.

FAILURE RATE λ (FAILURE IN TIME FIT) $1 \text{ FIT} = 1/10^9 \text{h}$ (1 failure per 10⁹ components test hours), $\lambda = r/(nt)$
 $r =$ number of failure, $n =$ test number, $t =$ test time

INSULATION VOLTAGE U_i Rms value of AC voltage designed for the insulation between terminals of the capacitor to case or earth. The insulation voltage is equal to the rated voltage of the capacitor, divided by , unless otherwise specified.

INSULATION RESISTANCE R_i Ration between applied DC Voltage and resulting leakage current after 1 minute of charge. It is defined in MΩ. Typically it is given as time constant R_i*C [μF] in seconds.

VOLTAGE BETWEEN TERMINALS U_{TT} Voltage between terminals.

VOLTAGE BETWEEN TERMINALS AND CASE U_{Tc} Voltage between terminals and case.

BUZZING NOISE Any buzzing noise produced by a capacitor is caused by the vibration of the film due to the Coulomb force that is generated between the electrodes with opposite poles. It is of no harm to the capacitor.

DIELECTRICAL ABSORPTION Due to the dielectrical absorption voltages may occur between the terminals. Please discharge the capacitor before usage.

SURFACE OVER TEMPERATURE Δθ_{case} When current continuously flow through the capacitor, the temperature inside the capacitor will rise induced by dissipated heat. If the temperature exceeds the maximum allowed hot-spot temperature, it might

cause a short circuit or fire. The limits described in the catalogue must not be exceeded and it's necessary to check the temperature on the capacitor's surface in operation.

FLAME RETARDATION Although flame retarding PU resin or plastic case material is used in the coating or encapsulation of plastic film capacitors, continuous exposure to high temperature ambient or fire will break the coating layer or plastic case of the capacitor, and may lead to melting and ignition of the capacitor element.

HUMID AMBIENT If used for a long time in a humid ambient, the capacitor might absorb humidity and oxidize the electrodes causing damage to the capacitor. In case of AC application, high humidity would increase the corona effect. This phenomenon causes a drop in capacitance and an increase of capacitor losses. Humidity needs to be avoided. If needed please inform Jianghai separately for technical adopted components.

STORAGE CONDITIONS 1) Capacitors must not be stored in corrosive atmospheres, particularly not when chlorides, sulfides, alkali, acids, lye, salts, organic solvents or similar substances are present. 2) It must not be stored in high temperature and/or high humidity environments. The following storage conditions must be kept (applicable only for storage in the original package): Temperature: ≤ 35 °C; Humidity: ≤ 80% RH, no dew allowed on the capacitor; Storage time: ≤ 24 months

MOUNTING Other devices, which are mounted near the capacitor, should not touch the capacitor. Additional heat coming from other components near the capacitor may reduce the lifetime of the capacitor. Do never attempt to bend or twist the capacitor after mounting and avoid any mechanical stress on the terminals. Never exceed the max. permissible torques when tightening the terminal screws or the mounting bolt's cap nuts.

CAUTION & WARNINGS Do not touch the terminals of capacitors. The energy stored in capacitors may be lethal. Ensure that the operating environment of the equipment into which the capacitor has been built, is within the specified conditions. Capacitors must not be used in corrosive atmospheres, particularly not when chlorides, sulfides, alkali, acid, lye, salts, organic solvents or similar substances are present. Electrical or mechanical misapplication may be hazardous. Personal injury or property damage may result from bursting of the capacitors or from expulsion of melted material.

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