



**CAPACITOR  
COMPETENCE**  
*since 1958*

FILM CAPACITORS

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FILM CAPACITORS · DC-LINK

# CBB 131 DL SERIES

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**JIANGHAI EUROPE**  
Electronic Components GmbH



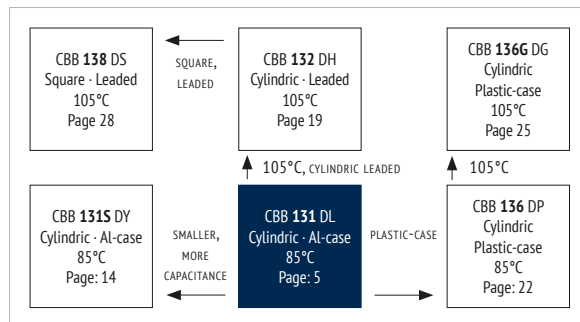
ENGINEERED SOLUTIONS

v2020.1

## FEATURES

- DC-Link
- Very low dissipation factor
- High ripple current capability
- Self-healing
- Long lifetime
- Aluminum case

## OVERVIEW



## PRODUCT



## APPLICATIONS

- High power frequency converters
- Motion control, welding equipment, elevators
- Electric and hybrid electric vehicles
- Photovoltaic and wind inverters

## CHARACTERISTICS

ITEM	CHARACTERISTICS
Climatic Category	55/85/56 (IEC 61071)
Operating Temperature	-55 ~ +85 °C ( $\theta_{hotspot} \leq 85$ °C)
Storage Temperature	-55 ~ +85 °C
Rated Voltage $U_{RDC}$	600 ~ 3.600V <sub>DC</sub>
Capacitance Range	44 ~ 7.200 $\mu$ F
Capacitance Tolerance	$\pm 10$ % (K), $\pm 5$ % (J)
Voltage between Terminals $U_{TT}$	$1,5 * U_{RDC}$ (20 °C, 10 s)
Voltage between Terminals & Case $U_{TC}$	$\geq 3.000V_{AC}$ (20°C, 50Hz, 10s)
Max. Overvoltage	$1,1 * U_{RDC}$ (30 % of time under load) $1,15 * U_{RDC}$ (30 min. per day) $1,2 * U_{RDC}$ (5 min. per day) $1,3 * U_{RDC}$ (1 min. per day) $1,5 * U_{RDC}$ (max. 30 ms, 100ms per day)
Insulation Resistance $R_i$ °C	$\geq 10.000 M\Omega * \mu$ F (20 °C, 100 V <sub>DC</sub> , 1 min)
Dielectric Dissipation Factor $\tan \delta$	$\leq 2 * 10^{-4}$ (20 °C, 100 Hz)
Life Time Expectancy	$\geq 100.000h$ , failure rate $\leq 50$ FIT ( $\theta_{hotspot} \leq 70^\circ C, U_{RDC}$ )
Reference Standard	IEC 61071:2007

## ENVIRONMENTAL

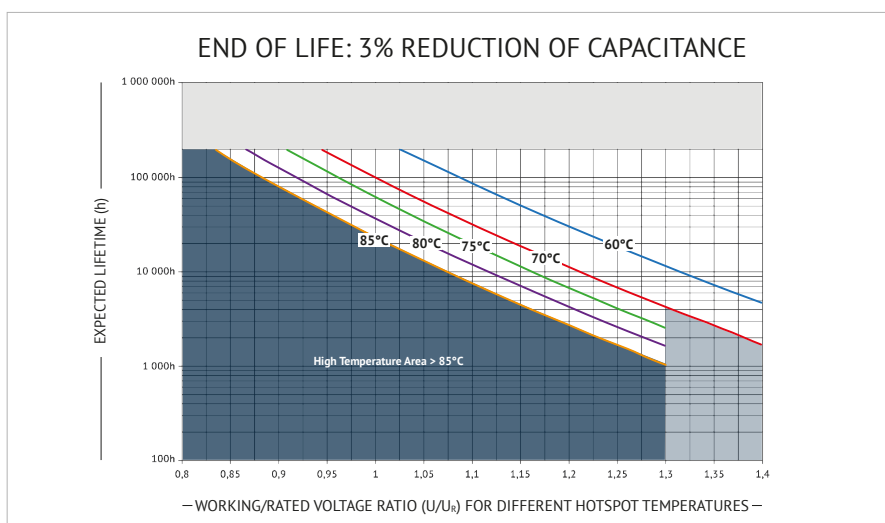
The products are RoHS, WEEE and REAcH compliant.

The detailed version please see separate "Environmental Certificates" document or [www.jianghai-europe.com](http://www.jianghai-europe.com)

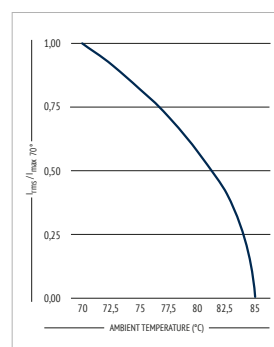
## APPROVALS

- UL94-V0:**
- Plastic & Compound Mass
- UL810:**
- CZDS2.E227010 (Construction)
- (except Can Style C & P)

## LIFETIME



## CURRENT DERATING



**CAN STYLES**

### CAN STYLE A

$H_1 = H + 5\text{mm}$

Aluminum Case with Flanging

$D_T = 12\text{mm}^*$

M6\*10 screw female\*

\*preferred

### CAN STYLE B UPDATED

$H_1 = H + 5\text{mm}$

Aluminum Case with Flanging

$D_T = 12\text{mm}^*$

M6\*10 screw female\*

\*preferred

### CAN STYLE C

$H_1 = H + 5\text{mm}$

Aluminum/Plastic Case

$D_T = 16\text{mm}^*$

M6\*10 screw female\*

M8\*10 screw female

\*preferred

### CAN STYLE D

$H_1 = H + 5\text{mm}$

Aluminum/Plastic Case  
Enlarged Anti-Creep Insulation

$D_T = 12\text{mm}^*$

M6\*10 screw female\*

\*preferred

### CAN STYLE E/F/G

$H_1 = H + 5\text{mm}$

Aluminum/Plastic Case  
Anti-Creep Insulation

Can Style E  $D_T = 12\text{mm}$

Can Style F  $D_T = 14\text{mm}$

Can Style G  $D_T = 16\text{mm}$

Can Style E M6\*10 screw female

Can Style F M6\*10 screw female

Can Style F M8\*10 screw female

Can Style G M8\*10 screw female

Can Style G M10\*10 screw female

\*preferred

### CAN STYLE J/K

$H_1 = H + 5\text{mm}$

Aluminum/Plastic Case  
Anti-Creep Insulation

$D_T = 12\text{mm}^*$

M6\*10 screw female\*

\*preferred

in mm

### CAN STYLE L/M

$H_1 = H + 5\text{mm}$

Aluminum/Plastic Case  
Anti-Creep Insulation

Can Style L:  $D_t = 14\text{ mm}$   
Can Style M:  $D_t = 12\text{ mm}$

M6\*10 screw female\*  
M8\*10 screw female

\*preferred

### CAN STYLE P

$H_1 = H + 5\text{mm}$

Aluminum/Plastic Case  
Double Pole  
Anti-Creep Insulation

$D_t = 16\text{mm}^*$

M6\*10 screw female\*

\*preferred

### CAN STYLE „X“

**OTHER CAN STYLES  
ON REQUEST**

on request

on request

on request

in mm

## DIMENSIONS

Diameter D ± 1,0 mm	Diameter Cab D1 ± 1,0 mm	Can Style	Pitch P ± 0,5mm	Length Cab Lc ± 1,0 mm	Diameter Terminal $D_t$ ± 0,5mm
76	-	C	32	20	16
76	-	J	32	10	12
85	-	A	32	-	12
86	-	C	32	20	16
86	89	D	32	35	12
86	-	E	32	25	12
86	-	F	32	25	14
86	-	B,J	32	10	12
86	-	K	32	32	12
89	92	D	45	35	12
96	-	C	45	20	16
116	-	A	50	-	12
116	-	C	50	40	16
116	-	P	50	40	16
116	-	L	50	10	14
116	-	M	50	10	12
136	-	G	50	35	16

Max. Torque for terminals: 3 Nm (M5), 5 Nm (M6), 6 Nm (M8), 8 Nm (M10)  
Max. Torque for stud mounting screws: 12 Nm (M12), 15Nm (M16)

■ **INTERNAL CONSTRUCTION**

(Example: Can Style C, double inner construction)

NO.	ITEM	MATERIAL
1	Winding Core	PC
2	Metalized Film	PP + Al, Zn
3	Metal Sprayed Electrode	Zn + Sn/Zn
4	Terminals	Cu, Sn-plated
5	Deck	PC
6	Aluminum Case	Al
7	Potting Compound	PU resin (+Epoxy)
8	Connection Electrode	Cu
9	Insulation Cover	PP
10	Winding Insulation	Paper + PP

■ **ACCESSOIRES FOR BRACKET MOUNTING (ORDER CODE „Y“)**

in mm

■ **MARKING**

	BRAND
<b>CBB 131</b>	SERIES DESIGNATION
540µF ±10%	CAPACITANCE AND TOLERANCE
$U_R = 600V_{DC}$	$U_R$ RATED VOLTAGE
$U_{TC} = 3000V\ 50/60\ HZ$	$U_{TC}$ VOLTAGE BETWEEN TERMINALS AND CASE, FREQUENCY
-55~+85°C IEC61071	TEMPERATURE RANGE, REFERENCE STANDARD
Discharge before handling	SAFETY WARNING
E37F26104	DATE CODE

### ORDER CODE

FC	C	A3	DL	427	K	K	136	0	3	1	A	1	E 3
Capacitor type	Product shape	DC rated voltage code (V)	Series code	Capacitance Code Examples (µF)	Capacitance tolerance	Diameter (mm)	Height (mm)	Terminal style	Terminal pitch (mm)	Stud bolt mounting	Can style	Inner Construction	For internal use
Film Cap. = FC	cylindrical = C	600 <b>2S</b> 700 <b>2Q</b> 800 <b>2K</b> 900 <b>R2</b> 1000 <b>3A</b> 1100 <b>A3</b> 1200 <b>3B</b> 1300 <b>O3</b> 1500 <b>C3</b> 1700 <b>F3</b> 2000 <b>3D</b> 2200 <b>D2</b> 2600 <b>3E</b> 2800 <b>L3</b> 3000 <b>3F</b> 3200 <b>3U</b> 3600 <b>3V</b>	CBB131 DL	100 <b>107</b> 220 <b>227</b> 420 <b>427</b> 500 <b>507</b> 1000 <b>108</b> 1100 <b>118</b>	+5% <b>J</b> ±10% <b>K</b> +20% <b>M</b>	76 <b>H</b> 85 <b>K</b> 86 <b>L</b> 89 <b>M</b> 96 <b>W</b> 116 <b>P</b> 136 <b>T</b>	95 <b>095</b> 120 <b>120</b> 136 <b>136</b> 155 <b>155</b> 175 <b>175</b> 225 <b>225</b> 230 <b>230</b>	Female M5*7 <b>8</b> Female M6*10 <b>0</b> Female M8*10 <b>2</b> Female M8*12 <b>6</b> Female M10*10 <b>4</b> Female M10*12 <b>B</b> Male M6*20 <b>1</b> Male M8*12 <b>9</b> Male M8*15 <b>A</b> Male M8*17 <b>7</b> Male M8*20 <b>3</b> Male M10*20 <b>5</b>	32 <b>3</b> 45 <b>4</b> 50 <b>5</b> 60 <b>6</b>	flat, with Y bracket <b>Y</b> flat, without bracket <b>0</b> bolt M12x16 <b>1</b> bolt M16x25 <b>2</b> bolt M12x12 <b>3</b>	Style A <b>A</b> Style B <b>B</b> Style C <b>C</b> Style D <b>D</b> Style E <b>E</b> Style F <b>F</b> Style G <b>G</b> Style J <b>J</b> Style K <b>K</b> Style L <b>L</b> Style M <b>M</b> Style P <b>P</b>	<b>1</b> <b>2</b> <b>3</b>	

### RATINGS

U <sub>k</sub> (V <sub>DC</sub> )	C <sub>e</sub> (µF)	I <sub>max</sub>				I <sup>(1)</sup> (A)	R <sub>s</sub> 20°C, 1kHz (mΩ)	R <sub>th</sub> <sup>(2)</sup> (K/W)	L <sub>s</sub> 20°C (nH)	D ±1,0 (mm)	H ±1,0 (mm)	ORDER CODE  *# to be defined, see ordering code table
		70°C, 1kHz (A)	60°C, 1kHz (A)	50°C, 1kHz (A)	≤40°C, 1kHz (A)							
<b>600 2S</b>	480	35	50	61	70	4800	1,6	5,1	≤50	76	95	FCC2SDL487#H095#3##1E3
	650	40	57	70	81	5200	1,1	5,6	≤50	85/86	95	FCC2SDL657#H095#3##1E3
	650	33	47	58	67	5200	1,9	4,7	≤60	76	120	FCC2SDL657#H120#3##1E3
	770	44	62	76	88	6160	1,2	4,3	≤60	76	136	FCC2SDL777#H136#3##1E3
	880	40	57	69	80	6248	1,3	4,8	≤60	85/86	120	FCC2SDL887#H120#3##1E3
	950	41	58	71	82	6650	1,4	4,2	≤60	76	175	FCC2SDL957#H175#3##2E3
	1000	46	66	81	93	6700	1,0	4,6	≤60	85/86	136	FCC2SDL108#H136#3##1E3
	1100	40	57	70	81	6600	1,4	4,4	≤50	85/86	155	FCC2SDL118#H155#3##2E3
	1200	48	68	83	96	7200	0,8	5,4	≤50	116	95	FCC2SDL128#P095#5##1E3
	1300	48	68	84	96	7800	1,0	4,3	≤60	85/86	175	FCC2SDL138#H175#3##2E3
	1600	47	67	82	94	9600	0,9	5,0	≤60	116	120	FCC2SDL168#H120#5##1E3
	1800	47	67	83	95	10800	1,1	4,0	≤60	85/86	225	FCC2SDL188#H225#3##2E3
	1900	43	61	75	86	11400	1,1	4,9	≤60	116	136	FCC2SDL198#H136#5##1E3
	2100	60	85	100	100	11550	0,6	4,6	≤60	116	155	FCC2SDL218#H155#5##2E3
	2400	61	86	100	100	12000	0,6	4,5	≤60	116	175	FCC2SDL248#H175#5##2E3
	3000	68	96	100	100	15000	0,8	2,7	≤60	116	230	FCC2SDL308#H230#5##2E3
	5000	71	100	100	100	25000	0,9	2,2	≤80	116	345	FCC2SDL508#H345#5##3E3
	5600	79	100	100	100	28000	0,8	2,0	≤80	136	252	FCC2SDL568#H252#5##2E3
7200	83	100	100	100	36000	0,8	1,8	≤80	136	345	FCC2SDL728#H345#5##3E3	
<b>700 2Q</b>	350	35	50	61	70	3600	1,6	5,1	≤60	76	95	FCC2QDL357#H095#3##1E3
	480	31	45	55	64	3840	2,1	4,7	≤60	76	120	FCC2QDL487#H120#3##1E3
	480	36	51	62	71	3840	1,4	5,6	≤60	85/86	95	FCC2QDL487#H095#3##1E3
	580	30	43	52	60	5800	2,4	4,6	≤60	76	136	FCC2QDL587#H136#3##1E3
	620	39	56	68	79	6200	1,5	4,3	≤60	76	155	FCC2QDL627#H155#3##1E3
	700	38	55	67	77	7200	1,6	4,2	≤60	76	175	FCC2QDL707#H175#3##1E3
	750	32	47	57	66	7200	2,0	4,6	≤60	86	136	FCC2QDL757#H136#3##1E3
	780	33	48	59	68	7800	1,9	4,6	≤60	86	136	FCC2QDL787#H136#3##1E3
	920	51	73	89	100	9200	0,7	5,4	≤60	116	95	FCC2QDL927#P095#5##1E3
	950	39	56	68	79	9500	1,5	4,3	≤60	86	175	FCC2QDL957#H175#3##2E3
	1200	44	63	77	89	7200	1,0	5,0	≤60	116	120	FCC2QDL128#H120#5##2E3
	1500	43	61	75	86	9000	1,1	4,9	≤60	116	136	FCC2QDL158#H136#5##1E3
	1500	52	74	90	100	9000	0,8	4,6	≤60	116	155	FCC2QDL158#H155#5##2E3
	1800	47	67	82	94	10800	1,0	4,5	≤60	116	175	FCC2QDL188#H175#5##2E3
	2300	68	96	100	100	13800	0,8	2,7	≤60	116	230	FCC2QDL238#H230#5##2E3
	4200	79	100	100	100	25200	0,8	2,0	≤80	136	252	FCC2QDL428#H252#5##2E3

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

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### JIANGHAI EUROPE

Electronic Components GmbH



ENGINEERED SOLUTIONS

Customer specific adaptations needed? Please contact JIANGHAI Europe GmbH:  
TELEFON: +49 (0) 2151 652088-0 | E-MAIL: [INFO@JIANGHAI-EUROPE.COM](mailto:INFO@JIANGHAI-EUROPE.COM)

6/12  
v2020.1

U <sub>r</sub> (V <sub>DC</sub> )	C <sub>r</sub> (μF)	I <sub>max</sub>				I <sup>(1)</sup> (A)	R <sub>s</sub> (mΩ)	R <sub>th</sub> <sup>(2)</sup> (K/W)	L <sub>s</sub> (nH)	D ±1,0 (mm)	H ±1,0 (mm)	ORDER CODE  *# to be defined, see ordering code table
		70°C, 1kHz (A)	60°C, 1kHz (A)	50°C, 1kHz (A)	≤40°C, 1kHz (A)							
<b>800 2K</b>	280	34	48	59	68	2800	1,7	5,1	≤50	76	95	FCC2KDL287#H095#3##1E3
	370	35	49	60	69	3700	1,5	5,6	≤50	85/86	95	FCC2KDL377#H095#3##1E3
	380	31	44	54	62	3800	2,2	4,7	≤60	76	120	FCC2KDL387#H120#3##1E3
	430	28	40	49	57	4300	2,6	4,6	≤60	76	136	FCC2KDL437#H136#3##1E3
	470	38	54	66	76	4700	1,6	4,3	≤60	76	155	FCC2KDL477#H155#3##2E3
	510	35	50	61	70	5100	1,7	4,8	≤60	85/86	120	FCC2KDL517#H120#3##1E3
	560	37	53	65	75	5600	1,7	4,2	≤60	76	175	FCC2KDL567#H175#3##2E3
	580	33	48	59	68	5800	1,9	4,6	≤60	85/86	136	FCC2KDL587#H136#3##1E3
	640	45	64	79	91	6400	1,1	4,4	≤50	85/86	155	FCC2KDL647#H155#3##2E3
	710	41	58	71	82	7100	1,1	5,4	≤50	116	95	FCC2KDL717#P095#5##1E3
	750	42	60	73	85	7500	1,3	4,3	≤60	85/86	175	FCC2KDL757#H175#3##2E3
	970	40	58	71	82	7760	1,2	5,0	≤60	116	120	FCC2KDL977#P120#5##1E3
	1000	42	60	73	85	8000	1,4	4,0	≤60	85/86	225	FCC2KDL108#H225#3##2E3
	1000	38	54	66	76	8000	1,4	4,9	≤60	116	136	FCC2KDL108#P136#5##1E3
	1200	52	74	90	100	9600	0,8	4,6	≤60	116	155	FCC2KDL128#P155#5##2E3
	1400	53	75	91	100	11200	0,8	4,5	≤60	116	175	FCC2KDL148#P175#5##2E3
	1800	60	86	100	100	11700	1,0	2,7	≤60	116	230	FCC2KDL188#P230#5##2E3
	2000	63	90	100	100	12000	0,7	3,5	≤80	136	175	FCC2KDL208#T175#5##2E3
	2700	65	93	100	100	16200	0,8	2,9	≤80	136	230	FCC2KDL278#T230#5##2E3
	3100	70	100	100	100	18600	1,0	2,0	≤80	136	252	FCC2KDL318#T252#5##2E3
3300	71	100	100	100	19800	0,9	2,2	≤80	116	345	FCC2KDL338#P345#5##3E3	
4300	78	100	100	100	25800	0,9	1,8	≤80	136	345	FCC2KDL438#T345#5##3E3	
<b>900 R2</b>	280	31	44	54	63	2800	2,0	5,1	≤50	76	95	FCCR2DL287#H095#3##1E3
	370	33	47	58	67	3700	1,6	5,6	≤50	85/86	95	FCCR2DL377#H095#3##1E3
	380	28	40	49	56	3800	2,6	4,7	≤60	76	120	FCCR2DL387#H120#3##1E3
	430	27	39	47	55	4300	2,9	4,6	≤60	76	136	FCCR2DL437#H136#3##1E3
	470	36	52	64	74	4700	1,7	4,3	≤60	76	155	FCCR2DL477#H155#3##2E3
	510	34	48	59	68	5100	1,8	4,8	≤60	85/86	120	FCCR2DL517#H120#3##1E3
	560	34	49	60	69	5600	2,0	4,2	≤60	76	175	FCCR2DL567#H175#3##2E3
	580	32	46	56	64	5800	2,1	4,6	≤60	85/86	136	FCCR2DL587#H136#3##1E3
	640	43	62	75	87	6400	1,2	4,4	≤50	85/86	155	FCCR2DL647#H155#3##2E3
	710	39	56	68	79	7100	1,2	5,4	≤50	116	95	FCCR2DL717#P095#5##1E3
	750	40	58	71	82	7500	1,4	4,3	≤60	85/86	175	FCCR2DL757#H175#3##2E3
	970	39	55	68	79	7600	1,3	5,0	≤60	116	120	FCCR2DL977#P120#5##1E3
	1000	40	58	71	82	8000	1,5	4,0	≤60	85/86	225	FCCR2DL108#H225#3##2E3
	1000	36	52	64	74	8000	1,5	4,9	≤60	116	136	FCCR2DL108#P136#5##1E3
	1200	47	66	81	93	9600	1,0	4,6	≤60	116	155	FCCR2DL128#P155#5##2E3
	1400	50	70	86	99	11200	0,9	4,5	≤60	116	175	FCCR2DL148#P175#5##2E3
	1800	58	82	100	100	11700	1,1	2,7	≤60	116	230	FCCR2DL188#P230#5##2E3
	2000	70	100	100	100	12000	0,8	2,5	≤80	136	175	FCCR2DL208#T175#5##2E3
	2700	61	88	100	100	16200	0,9	2,9	≤80	136	230	FCCR2DL278#T230#5##2E3
	3100	67	95	100	100	18600	1,1	2,0	≤80	136	252	FCCR2DL318#T252#5##2E3
3300	67	95	100	100	19800	1,0	2,2	≤80	116	345	FCCR2DL338#P345#5##3E3	
4300	74	100	100	100	25800	1,0	1,8	≤80	136	345	FCCR2DL438#T345#5##3E3	
<b>1000 3A</b>	220	29	40	50	57	2420	2,4	5,1	≤50	76	95	FCC3ADL227#H095#3##1E3
	290	32	46	56	65	3190	1,7	5,6	≤50	85/86	95	FCC3ADL297#H095#3##1E3
	300	27	39	48	55	3300	2,8	4,7	≤60	76	120	FCC3ADL307#H120#3##1E3
	330	26	38	47	54	3630	3,0	4,6	≤60	76	136	FCC3ADL337#H136#3##1E3
	360	35	51	62	72	3960	1,8	4,3	≤60	76	155	FCC3ADL367#H155#3##2E3
	400	33	47	57	66	4400	1,9	4,8	≤60	85/86	120	FCC3ADL407#H120#3##1E3
	420	34	49	60	69	4620	2,0	4,2	≤60	76	175	FCC3ADL427#H175#3##2E3
	450	32	46	56	64	4950	2,1	4,6	≤60	85/86	136	FCC3ADL457#H136#3##1E3
	500	43	62	75	87	5000	1,2	4,4	≤50	85/86	155	FCC3ADL507#H155#3##2E3
	540	39	56	68	79	5400	1,2	5,4	≤50	116	95	FCC3ADL547#P095#5##1E3
	560	40	58	71	82	5600	1,4	4,3	≤60	85/86	175	FCC3ADL567#H175#3##2E3
	740	39	55	68	79	7400	1,3	5,0	≤60	116	120	FCC3ADL747#P120#5##1E3
	810	45	65	79	91	8100	1,6	3,0	≤60	85/86	225	FCC3ADL817#H225#3##2E3
	860	35	51	62	71	8600	1,6	4,9	≤60	116	136	FCC3ADL867#P136#5##1E3
	900	49	70	85	98	8760	0,9	4,6	≤60	116	155	FCC3ADL907#P155#5##2E3
	1100	50	70	86	99	8800	0,9	4,5	≤60	116	175	FCC3ADL118#P175#5##2E3
	1400	58	82	100	100	11200	1,1	2,7	≤60	116	230	FCC3ADL148#P230#5##2E3
	1500	70	100	100	100	12000	0,8	2,5	≤80	136	175	FCC3ADL158#T175#5##2E3
	2100	61	88	100	100	12600	0,9	2,9	≤80	136	230	FCC3ADL218#T230#5##2E3
	2200	64	91	100	100	13200	1,1	2,2	≤80	116	345	FCC3ADL228#P345#5##3E3
2400	67	95	100	100	14400	1,1	2,0	≤80	136	252	FCC3ADL248#T252#5##2E3	
3200	71	100	100	100	19200	1,1	1,8	≤80	136	345	FCC3ADL328#T345#5##3E3	

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

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U <sub>R</sub> (V <sub>DC</sub> )	C <sub>R</sub> (μF)	I <sub>max</sub>				I <sup>(1)</sup> (A)	R <sub>s</sub> (mΩ)	R <sub>th</sub> <sup>(2)</sup> (K/W)	L <sub>s</sub> (nH)	D ±1,0 (mm)	H ±1,0 (mm)	ORDER CODE  *"#" to be defined, see ordering code table
		70°C, 1kHz (A)	60°C, 1kHz (A)	50°C, 1kHz (A)	≤40°C, 1kHz (A)							
1500 C3	170	26	37	45	52	2040	3,1	4,8	≤60	85/86	120	FCCC3DL177##120#3##1E3
	210	33	48	58	67	2520	2,0	4,4	≤60	85/86	155	FCCC3DL217##155#3##2E3
	310	30	44	53	62	3720	2,1	5,0	≤60	116	120	FCCC3DL317#P120#5##1E3
	330	31	45	55	63	3960	2,5	4,0	≤60	85/86	225	FCCC3DL337##225#3##2E3
	400	39	56	68	79	4800	1,4	4,6	≤60	116	155	FCCC3DL407#P155#5##2E3
	600	46	66	81	93	7200	1,7	2,7	≤60	116	230	FCCC3DL607#P230#5##2E3
	1000	70	100	100	100	12000	1,0	2,0	≤80	136	252	FCCC3DL108#T252#5##2E3
	1400	67	95	100	100	12000	1,0	2,2	≤80	116	345	FCCC3DL108#P345#5##3E3
1700 F3	130	24	35	42	49	1560	3,5	4,8	≤60	85/86	120	FCCF3DL137##120#3##1E3
	160	31	44	54	63	1920	2,3	4,4	≤60	85/86	155	FCCF3DL167##155#3##2E3
	240	28	41	50	58	2880	2,4	5,0	≤60	116	120	FCCF3DL247#P120#5##1E3
	250	29	42	51	59	3000	2,9	4,0	≤60	85/86	225	FCCF3DL257##225#3##2E3
	300	37	52	64	74	3600	1,6	4,6	≤60	116	155	FCCF3DL307#P155#5##2E3
	460	45	64	79	91	5520	1,8	2,7	≤60	116	230	FCCF3DL467#P230#5##2E3
	760	52	75	91	100	9120	1,8	2,0	≤80	136	252	FCCF3DL767#T252#5##2E3
	2000 3D	100	23	32	40	46	1200	4,0	4,8	≤60	85/86	120
120		30	43	52	60	1440	2,5	4,4	≤60	85/86	155	FCC3DDL127##155#3##2E3
190		27	38	47	54	2280	2,7	5,0	≤60	116	120	FCC3DDL197#P120#5##1E3
190		27	39	48	55	2280	3,3	4,0	≤60	85/86	225	FCC3DDL197##225#3##2E3
240		35	49	60	70	2880	1,8	4,6	≤60	116	155	FCC3DDL247#P155#5##2E3
370		41	58	71	82	4440	2,2	2,7	≤60	116	230	FCC3DDL377#P230#5##2E3
600		61	87	100	100	6000	1,2	2,2	≤80	116	345	FCC3DDL607#P345#5##3E3
600		64	91	100	100	6000	1,2	2,0	≤80	136	252	FCC3DDL607#T252#5##1E3
800	71	100	100	100	9600	1,1	1,8	≤80	136	345	FCC3DDL807#T345#5##3E3	
2200 D2	90	24	34	42	48	1080	3,7	4,6	≤60	86	136	FCCD2DL906#L136#3##1E3
	140	30	43	52	60	1680	2,2	5,0	≤60	116	120	FCCD2DL147#P120#5##2E3
	150	36	51	63	73	1800	1,9	4,0	≤60	86	225	FCCD2DL157#L225#3##2E3
	170	29	42	51	59	2040	2,5	4,6	≤60	116	155	FCCD2DL177#P155#5##2E3
	210	45	64	78	90	2520	1,1	4,5	≤60	116	175	FCCD2DL217#P175#5##2E3
	290	51	73	89	100	3480	1,4	2,7	≤60	116	230	FCCD2DL297#P230#5##2E3
	400	53	76	93	100	4800	1,2	2,9	≤80	136	230	FCCD2DL407#T230#5##2E3
	450	61	87	100	100	5400	1,2	2,2	≤80	116	345	FCCD2DL457#P345#5##3E3
500	62	87	100	100	6000	1,3	2,0	≤80	136	252	FCCD2DL507#T252#5##2E3	
660	71	100	100	100	7920	1,1	1,8	≤80	136	345	FCCD2DL667#T345#5##3E3	
2600 3E	63	23	33	41	47	756	4,1	4,4	≤60	86	155	FCC3EDL636#L155#3##1E3
	100	32	46	56	65	1200	2,4	4,0	≤60	86	225	FCC3EDL107#L225#3##1E3
	100	30	44	53	62	1200	2,1	5,0	≤60	116	120	FCC3EDL107#P120#5##2E3
	120	28	40	49	57	1440	2,7	4,6	≤60	116	155	FCC3EDL127#P155#5##2E3
	140	43	61	75	86	1680	1,2	4,5	≤60	116	175	FCC3EDL147#P175#5##2E3
	200	49	70	86	99	2400	1,5	2,7	≤60	116	230	FCC3EDL207#P230#5##1E3
	200	60	85	100	100	2400	1,1	2,5	≤80	136	175	FCC3EDL207#T175#5##2E3
	280	51	73	89	100	3360	1,3	2,9	≤80	136	230	FCC3EDL287#T230#5##2E3
	320	56	81	99	100	3840	1,4	2,2	≤80	116	345	FCC3EDL327#P345#5##3E3
	340	59	85	100	100	4080	1,4	2,0	≤80	136	252	FCC3EDL347#T252#5##2E3
	450	65	92	100	100	5400	1,3	1,8	≤80	136	345	FCC3EDL457#T345#5##3E3
2800 L3	86	28	40	49	57	1032	2,5	5,0	≤60	116	120	FCCL3DL866#P120#5##1E3
	88	33	48	58	67	1056	2,2	4,0	≤60	86	225	FCCL3DL886#L225#3##1E3
	100	26	38	46	53	1200	2,9	4,9	≤60	116	136	FCCL3DL107#P136#5##1E3
	120	33	46	56	65	1440	2,1	4,5	≤60	116	175	FCCL3DL127#P175#5##2E3
	170	51	73	89	100	2040	1,5	2,5	≤80	136	175	FCCL3DL177#T175#5##2E3
	240	49	70	87	100	2880	1,4	2,9	≤80	136	230	FCCL3DL247#T230#5##2E3
	270	56	81	99	100	3240	1,4	2,2	≤80	116	345	FCCL3DL277#P345#5##3E3
	290	55	79	97	100	3480	1,6	2,0	≤80	136	252	FCCL3DL297#T252#5##2E3
	390	68	92	100	100	4680	1,2	1,8	≤80	136	345	FCCL3DL397#T345#5##3E3
3000 3F	46	21	31	38	43	552	4,6	4,6	≤60	86	136	FCC3FDL466#L136#3##1E3
	74	27	39	48	55	888	2,6	5,0	≤60	116	120	FCC3FDL746#P120#5##1E3
	75	32	47	57	66	900	2,3	4,0	≤60	86	225	FCC3FDL756#L225#3##1E3
	100	41	58	72	83	1200	1,3	4,5	≤60	116	175	FCC3FDL107#P175#5##2E3
	140	50	71	87	100	1680	1,6	2,5	≤80	136	175	FCC3FDL147#T175#5##2E3

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

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U <sub>r</sub> (V <sub>DC</sub> )	C <sub>r</sub> (μF)	I <sub>max</sub>				f̂ <sup>(1)</sup> (A)	R <sub>s</sub> 20°C, 1kHz (mΩ)	R <sub>th</sub> <sup>(2)</sup> (K/W)	L <sub>s</sub> 20°C (nH)	D ±1,0 (mm)	H ±1,0 (mm)	ORDER CODE  *# to be defined, see ordering code table
		70°C, 1kHz (A)	60°C, 1kHz (A)	50°C, 1kHz (A)	≤40°C, 1kHz (A)							
<b>3000</b> <b>3F</b>	200	49	70	86	99	2400	1,4	2,9	≤80	136	230	FCC3FDL207#T230#5##2E3
	240	64	91	100	100	2880	1,1	2,2	≤80	116	345	FCC3FDL247#P345#5##3E3
	250	64	91	100	100	3000	1,2	2,0	≤80	136	252	FCC3FDL257#T252#5##2E3
	330	74	100	100	100	3960	1,0	1,8	≤80	136	345	FCC3FDL337#T345#5##3E3
<b>3200</b> <b>3U</b>	64	28	41	50	58	768	2,4	5,0	≤60	116	120	FCC3UDL646#P120#5##1E3
	65	22	32	39	45	780	4,9	4,0	≤60	86	225	FCC3UDL656#L225#3##1E3
	92	41	58	72	83	1104	1,3	4,5	≤60	116	175	FCC3UDL926#P175#5##2E3
	120	48	69	84	97	1440	1,7	2,5	≤80	136	175	FCC3UDL127#T175#5##2E3
	180	49	70	86	99	2160	1,4	2,9	≤80	136	230	FCC3UDL187#T230#5##2E3
	210	59	83	100	100	2520	1,3	2,2	≤80	116	345	FCC3UDL217#P345#5##3E3
	220	59	85	100	100	2640	1,4	2,0	≤80	136	252	FCC3UDL227#T252#5##2E3
300	68	96	100	100	3600	1,2	1,8	≤80	136	345	FCC3UDL307#T345#5##3E3	
<b>3600</b> <b>3V</b>	44	29	42	51	59	528	2,3	5,0	≤60	116	120	FCC3VDL446#P120#5##1E3
	45	35	50	61	71	540	2,0	4,0	≤60	86	225	FCC3VDL456#L225#3##1E3
	88	51	73	89	100	1056	1,4	2,7	≤60	116	230	FCC3VDL886#P230#5##2E3
	120	51	73	89	100	1440	1,3	2,9	≤80	136	230	FCC3VDL127#T230#5##2E3
	160	61	86	100	100	1920	1,2	2,2	≤80	116	345	FCC3VDL167#P345#5##3E3
	170	62	88	100	100	2040	1,3	2,0	≤80	136	252	FCC3VDL177#T252#5##2E3
	230	74	100	100	100	2760	1,0	1,8	≤80	136	345	FCC3VDL237#T345#5##3E3

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

# HANDLING PRECAUTIONS

**WARRANTY** The information contained in this datasheet does neither form part of any quotation nor of a contract, it is believed to be accurate, reliable and up to date. Quality data are based on the statistical evaluations of a large quantity of parts and do not constitute a guarantee in a legal sense. However, agreement on these specifications does mean that the customer may claim for replacement of individual defective capacitors within the terms of delivery. We cannot assume any liability beyond the replacement of defective components. This applies in particular to any further consequences of component failure. Furthermore it must be taken into consideration that the figures stated for lifetime and failure rates refer to the average production status and are therefore to be understood as mean values (statistical expectations) for a large number of delivery lots of identical capacitors. These figures are based on application experience and data obtained from preceding tests under normal conditions, or – for purpose of accelerated aging – more severe conditions. JIANGHAI reserves the right to change these specifications without prior notice. Any application information given is advisory and does not form part of any specification. The products are not primarily designed for use in life supporting applications, devices or systems where malfunction of these products can reasonably be expected to result in personal injury. JIANGHAI customers using or selling these products for use in such applications without prior written consent of JIANGHAI do so at their own risk and agree fully to indemnify JIANGHAI for any damage resulting from such improper use or sale. This version of the datasheet supersedes all previous versions.

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

**RATED VOLTAGE  $U_R, U_N$**  Rated Voltage is the maximum operating peak voltage of either polarity but of a non-reversing type waveform (DC capacitors only), for which the capacitor has been designed, for continuous operation. The Rated Voltage is marked on the capacitor. See also Voltage Derating tables.

**RATED AC VOLTAGE  $U_{RMS}$**  Maximum RMS value for the sinusoidal alternating voltage.

**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.)

**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.

**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.  $\hat{I} = C_N \cdot (dV/dt)$

**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:  $ESR = \tan\delta / (\omega C) = R_s + \tan\delta_s / (\omega C)$

**DIELECTRIC DISSIPATION FACTOR  $\tan\delta_0$**  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.  $\Theta_{HOTSPOT} = \Theta_{AMBIENT} + P_{LOSS} \cdot R_{TH}$

$R_{TH}$ : thermal resistance,  $P_{LOSS}$ : Powerloss  $P_{LOSS} = ESR \cdot I_{RMS}^2$ ,  $\Theta_{AMBIENT}$  = 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.

**OPERATING CURRENT** The pulse (or AC) current flowing through the capacitor is expressed as:  $\hat{I} = C \cdot dV/dt$ . 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.

**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

**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  $\lambda$  (FAILURE IN TIME FIT)** 1 FIT = 1/10<sup>9</sup>h (1 failure per 10<sup>9</sup> 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  $R_i$**  Ratio 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  $R_i \cdot C$  [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.

**SURFACE OVER TEMPERATURE  $\Delta\Theta_{CASE}$**  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.

Jianghai Europe GmbH, v3 0620

## JIANGHAI EUROPE

Electronic Components GmbH



ENGINEERED SOLUTIONS

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## ABOUT US

# Capacitors from Jianghai

JIANGHAI EUROPE ELECTRONIC COMPONENTS GMBH IS THE EUROPEAN SALES ORGANIZATION OF NANTONG JIANGHAI CAPACITOR CO., LTD., NANTONG (CHINA). SINCE 2004, SALES, MARKETING, TECHNICAL SUPPORT, CUSTOMER SERVICE TEAM AND WAREHOUSE OF JIANGHAI EUROPE ELECTRONIC COMPONENTS GMBH ARE LOCATED IN KREFELD AND KEMPEN (GERMANY).

### » ELECTROLYTIC CAPACITORS

Jianghai has grown since its foundation in 1958 to become the largest Chinese manufacturer of aluminum capacitors generating revenues of more than 500 million USD in 2019. While Jianghai started in the beginning with the production of specialty chemicals (e.g., electrolyte solutions), it entered the production of aluminum electrolytic capacitors already in 1970.



### » INTEGRATION OF PREMATERIAL

More recently, Jianghai extended its production range by integrating high and low voltage anode foil etching and forming facilities. All factories are located in mainland China: the most important ones are in Nantong (north to Shanghai), in Inner Mongolia, and in Xi'An area. Jianghai is well prepared for further expansion due to its successful entrance to the stock market in summer 2010.

### » FILM CAPACITORS

Jianghai's product range comprises aluminum electrolytic capacitors in screw terminal, snap-in and radial leaded styles. In 2012, the product portfolio was complemented by a range of power film capacitors. For this new business unit, Jianghai also follows the strategy of vertical integration and thus the production will extend from the preparation of the plastic film to the assembly of the finished goods. The product portfolio of DC-Link and Snubber capacitors has been enlarged in the year 2016 by AC-film and X/Y capacitors. Highly automated production facilities ensure the efficient mass production of film capacitor modules. Driven by the thriving electric vehicle market in China, Jianghai has attained a leading position for the supply of these customer specific components.



### » POLYMER CAPACITORS

The year 2013 was marked by a major breakthrough in R&D for polymer aluminum electrolytic capacitors: the voltage proof for these ultra-low ESR products was pushed out to as much as 200V, enabling the utilization of these advanced capacitors in more applications, e.g. in white goods, industrial automation, telecom infrastructure, power supplies, and LED ballasts.

### » CAPACITOR COMPETENCE CENTER

Global presence of experienced sales and technical marketing experts at offices in Europe, Asia and the Americas ensure the local support of our customers based on sound know-how in all project phases. In 2014 Jianghai Europe has established an additional service for its customers in Europe: Experts for capacitors are awaiting telephone calls or emails at the CCCenter as a kind of hotline for all kind of technical requests.



### » CUSTOMIZED PRODUCTS

Jianghai's particular strength as a volume manufacturer is to offer customized products. Jianghai focuses on the demanding professional industrial segment with many power electronics applications. Research and development in collaboration with several specialized university institutes as well as the access to all vital pre-materials enable Jianghai to create engineered, customized solutions to fit smoothly into a specific application.

Jianghai is continuously improving processes, thereby enhancing the quality of its products and services. The list of certificates awarded to Jianghai reflects its level of achievement. In the year 2013, the Jianghai Europe sales office has become certified according to ISO9001 and ISO14001.

### » CONTACT

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ENGINEERED SOLUTIONS

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