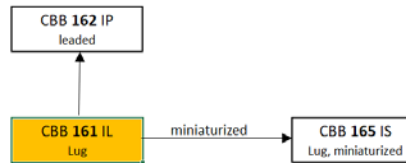


## Polypropylene Film Capacitors for Snubber Applications

### Features

- 105°C
- Very low dissipation factor
- Highest peak pulse capability
- Double-sided metallized electrodes
- Internal series connection
- Metal sprayed contacts for low ESL
- Plates for direct IGBT connection
- Self-healing
- RoHS compliant (2011/65/EU)



### Applications

- High pulse and high frequency circuits
- IGBT applications

Item	Characteristics
<b>Climatic Category</b>	40/105/56 (IEC 61071)
<b>Operating Temperature</b>	-40 ~ +105 °C ( $\theta_{\text{hotspot}} \leq 105 \text{ °C}$ ) $\theta_{\text{hotspot}} = 85\sim 105\text{ °C}$ : Voltage Derating of 1,35% per °C for $U_{\text{RDC}}$
<b>Storage Temperature</b>	-40 ~ +105 °C
<b>DC Voltage Rating <math>U_{\text{R,DC}}</math></b>	700 ~ 2000 $V_{\text{DC}}$
<b>Capacitance Range</b>	0,2 ~ 7,5 $\mu\text{F}$
<b>Capacitance Tolerance</b>	$\pm 10 \%$ (K), $\pm 5 \%$ (J)
<b>Voltage between Terminals <math>U_{\text{TT}}</math></b>	$1,5 * U_{\text{RDC}}$ (20 °C, 10 s)
<b>Voltage between Terminals and Case <math>U_{\text{TC}}</math></b>	3000 $V_{\text{AC}}$ (20 °C, 50 Hz, 10 s)
<b>Capacitor Dissipation Factor</b>	$\tan \delta \leq 5 * 10^{-4}$ (20 °C, 1 kHz)
<b>Dielectric Dissipation Factor</b>	$\tan \delta_o \leq 2 * 10^{-4}$ (20 °C, 1 kHz)
<b>Insulation Resistance</b>	$\geq 30.000 \text{ M}\Omega * \mu\text{F}$ (20 °C, 100 $V_{\text{DC}}$ , 1 min)
<b>Life Time Expectancy</b>	$\geq 100.000 \text{ h}$ , Failure Rate $\leq 50 \text{ FIT}$ (70 °C)
<b>Reference Standard</b>	IEC 61071:2007, REACH, RoHS

### Ratings for CBB 161 IL Series

$U_{\text{R}}$ (V)	$C_{\text{R}}$ ( $\mu\text{F}$ )	$dV/dt$ 20 °C ( $V/\mu\text{s}$ )	$\hat{i}^{(1)}$ (A)	$R_s^{(2)}$ 100 kHz 20 °C (m $\Omega$ )	$I_{\text{max}}^{(3)}$ 100 kHz 70 °C (A)	W $\pm 1.0$ (mm)	H $\pm 1.0$ (mm)	T $\pm 1.0$ (mm)	Ordering Code
700V <sub>DC</sub> 2Q	1.20	325	390	10	12.4	42.5	28	24	FCS2QIL125**FA****14*E3
	1.80	325	585	8	16.8	42.5	36	24	FCS2QIL185**FD****14*E3
	2.20	325	715	7	18.8	42.5	33	33	FCS2QIL225**FB****14*E3
	2.50	325	813	6	20.3	42.5	35.5	33.5	FCS2QIL255**FC****14*E3
	3.00	325	975	5	22.4	42.5	45	30	FCS2QIL305**FF****14*E3
	4.00	325	1300	4	25	42.5	43	42	FCS2QIL405**FE****14*E3
	4.20	260	1092	3	26	57.5	43.5	29.5	FCS2QIL425**HG****14*E3
	4.50	260	1170	3	26	57.5	45	30	FCS2QIL455**HH****14*E3
	5.00	260	1300	3	27	57.5	45	35	FCS2QIL505**HJ****14*E3
	5.50	260	1430	2	27	57.5	50	35	FCS2QIL555**HL****14*E3
	6.00	260	1560	2	28	57.5	45	45	FCS2QIL605**HK****14*E3
7.50	260	1950	2	30	57.5	55	40	FCS2QIL755**HM****14*E3	

(1) Maximum permissible peak current

(2) Series resistance at 20°C ambient temperature

(3) Maximum permissible r.m.s. ripple current

\*\*\*\* to be defined, see ordering code table  
Customized products are available on request

## Ratings for CBB 161 IL Series

$U_R$ (V)	$C_R$ ( $\mu F$ )	dV/dt 20 °C (V/ $\mu s$ )	$\hat{i}^{(1)}$ (A)	$R_s^{(2)}$ 100 kHz 20 °C (m $\Omega$ )	$I_{max}^{(3)}$ 100 kHz 70 °C (A)	W $\pm 1.0$ (mm)	H $\pm 1.0$ (mm)	T $\pm 1.0$ (mm)	Ordering Code
850V <sub>DC</sub> K2	0.47	650	306	10	11.5	42.5	28	24	FCSK2IL474**FA****14*E3
	0.70	650	455	10	15.3	42.5	36	24	FCSK2IL704**FD****14*E3
	0.80	650	520	9	17.2	42.5	33	33	FCSK2IL804**FB****14*E3
	0.80	650	520	10	11.8	42.5	28	24	FCSK2IL804**FA****14*E3
	1.00	650	650	8	18.6	42.5	35.5	33.5	FCSK2IL105**FC****14*E3
	1.20	650	780	9	15.6	42.5	36	24	FCSK2IL125**FD****14*E3
	1.20	650	780	7	20.6	42.5	45	30	FCSK2IL125**FF****14*E3
	1.50	650	975	8	17.6	42.5	33	33	FCSK2IL155**FB****14*E3
	1.50	650	975	6	22	42.5	43	42	FCSK2IL155**FE****14*E3
	1.50	455	683	6	22	57.5	43.5	29.5	FCSK2IL155**HG****14*E3
	1.80	650	1170	7	19.8	42.5	35.5	33.5	FCSK2IL185**FC****14*E3
	1.80	455	819	6	23	57.5	45	30	FCSK2IL185**HH****14*E3
	2.00	455	910	5	24	57.5	45	35	FCSK2IL205**HJ****14*E3
	2.20	455	1001	5	24	57.5	50	35	FCSK2IL225**HL****14*E3
	2.20	650	1430	6	21.5	42.5	45	30	FCSK2IL225**FF****14*E3
	2.50	455	1138	4	25	57.5	45	45	FCSK2IL255**HK****14*E3
	2.80	650	1820	5	24	42.5	43	42	FCSK2IL285**FE****14*E3
	3.00	455	1365	4	26	57.5	55	40	FCSK2IL305**HM****14*E3
	3.00	455	1365	4	24	57.5	43.5	29.5	FCSK2IL305**HG****14*E3
	3.00	455	1365	4	25	57.5	45	30	FCSK2IL305**HH****14*E3
3.50	455	1592	4	25	57.5	45	35	FCSK2IL355**HJ****14*E3	
4.50	455	2047	3	27	57.5	50	35	FCSK2IL455**HL****14*E3	
5.00	455	2275	3	27	57.5	45	45	FCSK2IL505**HK****14*E3	
5.00	455	2275	2	29	57.5	55	40	FCSK2IL505**HM****14*E3	
1000V <sub>DC</sub> 3A	0.65	500	325	10	11.6	42.5	28	24	FCS3AIL654**FA****14*E3
	1.00	500	500	9	15.5	42.5	36	24	FCS3AIL105**FD****14*E3
	1.20	500	600	8	17.5	42.5	33	33	FCS3AIL125**FB****14*E3
	1.40	500	700	7	18.8	42.5	35.5	33.5	FCS3AIL145**FC****14*E3
	1.80	500	900	6	21	42.5	45	30	FCS3AIL185**FF****14*E3
	2.20	500	1100	5	23	42.5	43	42	FCS3AIL225**FE****14*E3
	2.20	350	770	6	23	57.5	43.5	29.5	FCS3AIL225**HG****14*E3
	2.50	350	875	5	24	57.5	45	30	FCS3AIL255**HH****14*E3
	3.00	350	1050	5	24	57.5	45	35	FCS3AIL305**HJ****14*E3
	3.30	350	1155	4	25	57.5	50	35	FCS3AIL335**HL****14*E3
	3.50	350	1225	4	25	57.5	45	45	FCS3AIL355**HK****14*E3
	4.50	350	1575	4	28	57.5	55	40	FCS3AIL455**HM****14*E3
1200V <sub>DC</sub> 3B	0.33	800	264	11	11.4	42.5	28	24	FCS3BIL334**FA****14*E3
	0.47	800	376	10	11.5	42.5	28	24	FCS3BIL474**FA****14*E3
	0.50	800	400	10	15	42.5	36	24	FCS3BIL504**FD****14*E3
	0.60	800	480	9	16.8	42.5	33	33	FCS3BIL604**FB****14*E3
	0.70	800	560	9	18.4	42.5	35.5	33.5	FCS3BIL704**FC****14*E3
	0.70	800	560	10	15.3	42.5	36	24	FCS3BIL704**FD****14*E3
	0.80	800	640	9	17.2	42.5	33	33	FCS3BIL804**FB****14*E3
	0.80	800	640	8	20.5	42.5	45	30	FCS3BIL804**FF****14*E3
	1.00	800	800	7	21	42.5	43	42	FCS3BIL105**FE****14*E3
	1.00	560	560	6	22	57.5	43.5	29.5	FCS3BIL105**HG****14*E3
	1.00	800	800	8	18.6	42.5	35.5	33.5	FCS3BIL105**FC****14*E3
	1.20	800	960	7	20.6	42.5	45	30	FCS3BIL125**FF****14*E3
	1.20	560	672	6	22	57.5	45	30	FCS3BIL125**HH****14*E3
	1.40	560	784	5	23	57.5	45	35	FCS3BIL145**HJ****14*E3
	1.50	800	1200	6	22	42.5	43	42	FCS3BIL155**FE****14*E3
	1.50	560	840	6	22	57.5	43.5	29.5	FCS3BIL155**HG****14*E3

$U_R$ (V)	$C_R$ ( $\mu F$ )	$dV/dt$ 20 °C (V/ $\mu S$ )	$\hat{I}^{(1)}$ (A)	$R_s^{(2)}$ 100 kHz 20 °C (m $\Omega$ )	$I_{max}^{(3)}$ 100 kHz 70 °C (A)	$W$ $\pm 1.0$ (mm)	$H$ $\pm 1.0$ (mm)	$T$ $\pm 1.0$ (mm)	Ordering Code
1200V <sub>DC</sub> 3B	1.60	560	896	5	23	57.5	50	35	FCS3BIL165**HL****14*E3
	1.70	560	952	4	24	57.5	45	45	FCS3BIL175**HK****14*E3
	1.80	560	1008	6	23	57.5	45	30	FCS3BIL185**HH****14*E3
	2.00	560	1120	5	24	57.5	45	35	FCS3BIL205**HJ****14*E3
	2.00	560	1120	4	25	57.5	55	40	FCS3BIL205**HM****14*E3
	2.20	560	1232	5	24	57.5	50	35	FCS3BIL225**HL****14*E3
	2.50	560	1400	4	25	57.5	45	45	FCS3BIL255**HK****14*E3
	3.00	560	1680	4	26	57.5	55	40	FCS3BIL305**HM****14*E3
1600V <sub>DC</sub> 3C	0.33	800	264	11	11.4	42.5	28	24	FCS3CIL334**FA****14*E3
	0.50	800	400	10	15	42.5	36	24	FCS3CIL504**FD****14*E3
	0.60	800	480	9	16.8	42.5	33	33	FCS3CIL604**FB****14*E3
	0.70	800	560	9	18.4	42.5	35.5	33.5	FCS3CIL704**FC****14*E3
	0.80	800	640	8	20.5	42.5	45	30	FCS3CIL804**FF****14*E3
	1.00	800	800	7	21	42.5	43	42	FCS3CIL105**FE****14*E3
	1.00	560	560	6	22	57.5	43.5	29.5	FCS3CIL105**HG****14*E3
	1.20	560	672	6	22	57.5	45	30	FCS3CIL125**HH****14*E3
	1.40	560	784	5	23	57.5	45	35	FCS3CIL145**HJ****14*E3
	1.60	560	896	5	23	57.5	50	35	FCS3CIL165**HL****14*E3
	1.70	560	952	4	24	57.5	45	45	FCS3CIL175**HK****14*E3
	2.00	560	1120	4	25	57.5	55	40	FCS3CIL205**HM****14*E3
2000V <sub>DC</sub> 3D	0.20	1000	200	11	11.3	42.5	28	24	FCS3DIL204**FA****14*E3
	0.30	1000	300	11	14.9	42.5	36	24	FCS3DIL304**FD****14*E3
	0.39	1000	390	10	16.6	42.5	33	33	FCS3DIL394**FB****14*E3
	0.42	1000	420	9	18.2	42.5	35.5	33.5	FCS3DIL424**FC****14*E3
	0.56	1000	560	9	20.1	42.5	45	30	FCS3DIL564**FF****14*E3
	0.70	1000	700	8	20	42.5	43	42	FCS3DIL704**FE****14*E3
	0.75	720	540	8	21	57.5	43.5	29.5	FCS3DIL754**HG****14*E3
	0.82	720	590	7	21	57.5	45	30	FCS3DIL824**HH****14*E3
	0.90	720	648	6	22	57.5	45	35	FCS3DIL904**HJ****14*E3
	1.00	720	720	6	22	57.5	50	35	FCS3DIL105**HL****14*E3
	1.20	720	864	5	22	57.5	45	45	FCS3DIL125**HK****14*E3
	1.40	720	1008	4	24	57.5	55	40	FCS3DIL145**HM****14*E3

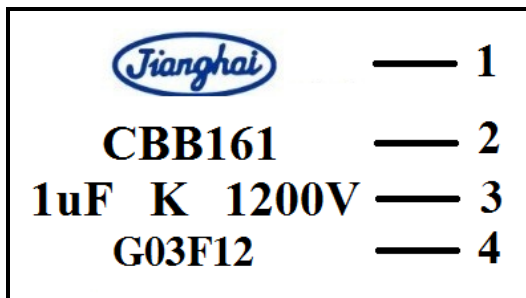
(1) Maximum permissible peak current

(2) Series resistance at 20°C ambient temperature

(3) Maximum permissible r.m.s. ripple current

\*\*\*\* to be defined, see ordering code table  
Customized products are available on request

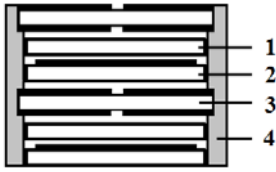
## Marking



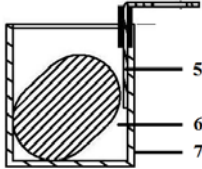
No.	Item
1	Brand
2	Series Designation
3	Capacitance, Tolerance, and Rated Voltage
4	Date Code



## Internal Construction

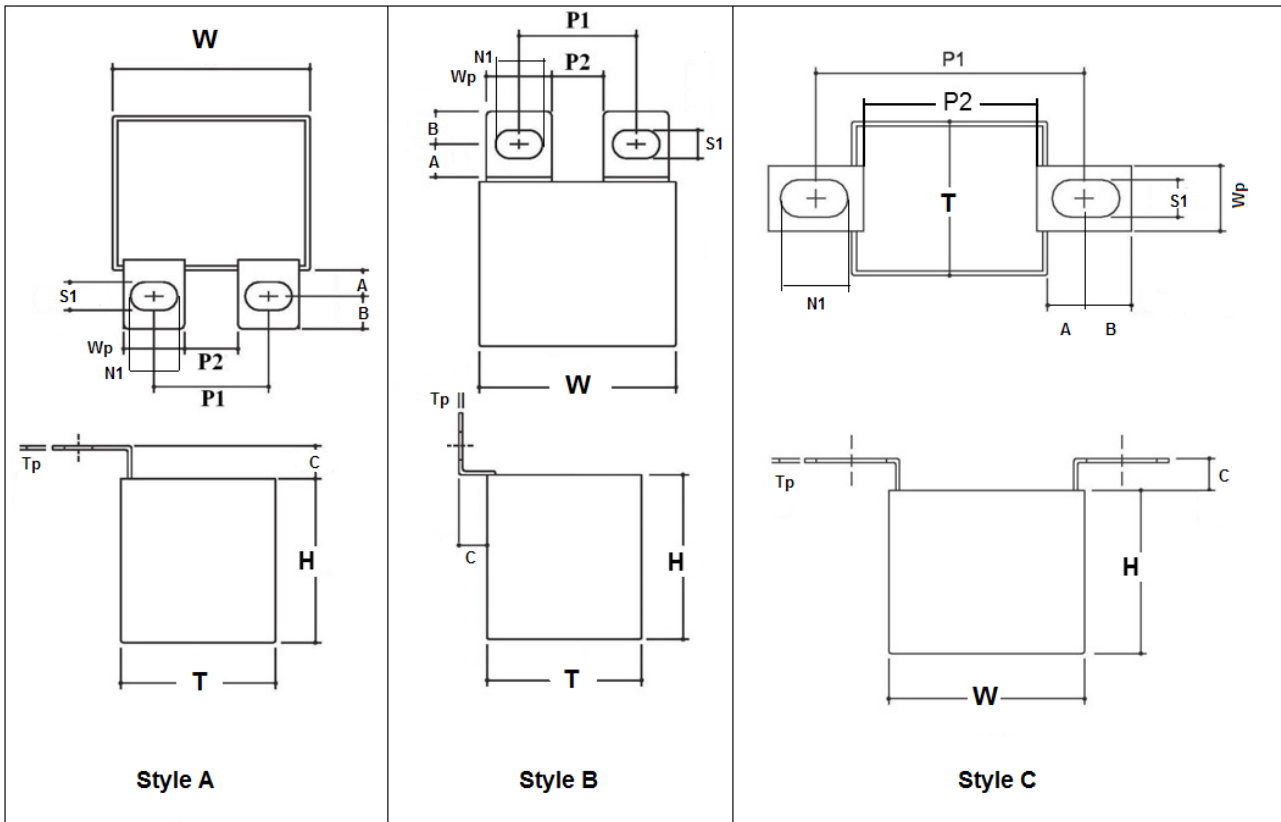


No.	Item	Material
1	Dielectric Film	Polypropylene
2	Single-sided Metallized Film	PP + Al
3	Double sided Metallized Carrier Film	PET + Al
4	Metal Sprayed Contact	Zn + Sn/Zn



No.	Item	Material
5	Terminals	Sn-coated Cu
6	Potting Compound	Epoxy
7	Case	Flame retardant PBT

## Dimensions

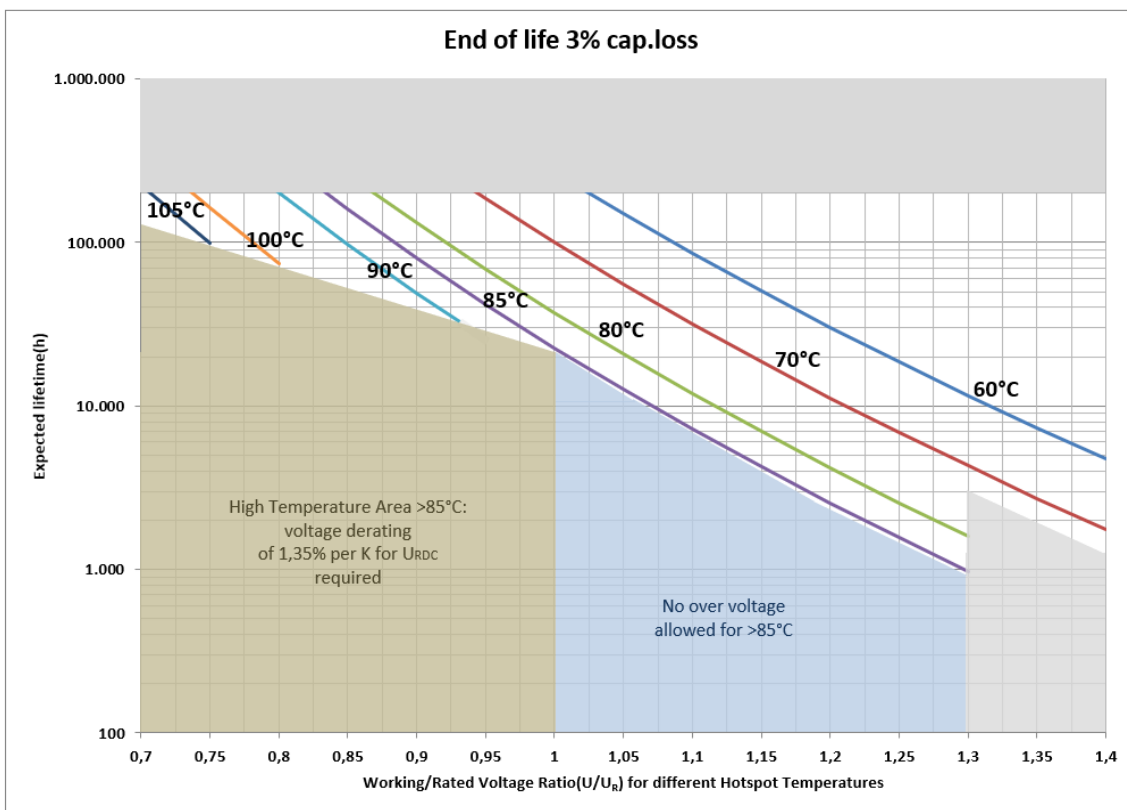


## Preferred Terminals (others on request)

Terminal Style	Length of Case $W \pm 1,0$ (mm)	Mounting Hole Pitch $P_1 \pm 0,5$ (mm)	Gap between Terminals $P_2 \pm 0,5$ (mm)	Width Terminal Plate $W_p \pm 0,3$ (mm)	Thickness Terminal $T_p \pm 0,1$ (mm)	Distance of Terminal $C \pm 1$ (mm)	Width of Hole $S_1 \pm 0,1$ (mm)	Length of Hole $N_1 \pm 0,3$ (mm)	Position of Hole $A \pm 0,2$ (mm)	Distance Hole $B \pm 0,2$ (mm)
Style A/B	42,5	24,0	10,0	14,0	1,0	6,0	M6: 6,5 M8: 8,5	M6: 8,5 M8: 10,5	7,0	7,0
Style A/B	42,5	26,0	12,0	14,0	1,0	6,0	M6: 6,5 M8: 8,5	M6: 8,5 M8: 10,5	7,0	7,0
Style A/B	57,5	24,0	10,0	14,0	1,0	6,0	M6: 6,5 M8: 8,5	M6: 8,5 M8: 10,5	7,0	7,0
Style A/B	57,5	37,0	23,0	14,0	1,0	6,0	M6: 6,5 M8: 8,5	M6: 8,5 M8: 10,5	7,0	7,0
Style C	42,5	60,0	38,0	14,0	1,0	6,0	M8: 8,2	M8: 14	8,5	10,0
Style C	57,5	75,0	53,0	14,0	1,0	6,0	M8: 8,2	M8: 14	8,5	10,0



### Life Time Expectancy



### 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).

### Ordering Code

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
FC	S	3B	IL	105	K	A	F	A	4	0	2	6	1	9	1	E	3					
Capacitor type	Product shape	DC rated voltage code (V)	Series code	Capacitance code (µF)	Capacitance tolerance	Plate Style	Dimension Code (WxHxT in mm)	Pitch P1 (mm)	Gap P2 (mm)	Width of plates Wp (mm)	Hole shape	Internal use										
Film cap. = FC	Square box = S	630 = 2J 700 = 2Q 850 = K2 1000 = 3A 1200 = 3B 1600 = 3C 2000 = 3D 2500 = 3E 3000 = 3F	CBB161 = IL	0.22 = 224 0.33 = 334 0.47 = 474 0.68 = 684 0.82 = 824 1.0 = 105 1.2 = 125 1.5 = 155 2.0 = 205 2.2 = 225 2.5 = 255 3.0 = 305 3.3 = 335 4.0 = 405 4.7 = 475 5.0 = 505 6.0 = 605 6.8 = 685 10.0 = 106	±5% = J ±10% = K	Style A = A Style B = B Style C = C	42,5x28x24 = FA 42,5x33x33 = FB 42,5x35,5x33,5 = FC 42,5x36x24 = FD 42,5x43x42 = FE 42,5x45x30 = FF 42,5x50x35 = FK 57,5x43,5x29,5 = HG 57,5x45x30 = HH 57,5x45x35 = HJ 57,5x45x45 = HK 57,5x50x35 = HL 57,5x55x40 = HM	20 = 20 24 = 24 25 = 25 35 = 35 40 = 40 57 = 57	06 = 06 10 = 10 11 = 11 26 = 26 38 = 38 53 = 53	10 = 10 12 = 12 14 = 14 19 = 19	Circular M6 = 0 Oval M6 = 1 Circular M8 = 2 Oval M8 = 3											

## Jianghai Film Capacitors

**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, failure rates and outlier percentages 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.

**Rated Voltage  $U_R$ :** Rated Voltage is the 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 Rated Voltage is marked on the capacitor and defined in the datasheets as  $U_R$ .

**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.

**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  $20\Omega/V$  to  $1000\Omega/V$  or more to limit the current.

When connecting multiple film capacitors in parallel in withstand voltage test or life test, connect a resistance of  $20\Omega/V$  to  $1000\Omega/V$  or more in series to each capacitor (For detail see the specification). 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 maybe dangerous.

**Operating Current:** The pulse (or AC) current flowing through the capacitor is expressed as:  $I = C \times dV/dt$ . 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:** Use film capacitors only within the specified operating temperature range.

**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. The capacitors used in DC-Link circuits will have an expected lifetime of approximately 100000 hours at rated voltage and  $70^\circ\text{C}$  hot spot temperature.

**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  $\sqrt{2}$ , unless otherwise specified.

**Voltage between terminals  $U_{TT}$ :** Voltage between terminals (at  $20^\circ\text{C}$ , 10s):  $1.5 \times U_{RDC}$

**Voltage between terminals and case  $U_{TC}$ :** Voltage between terminals and case (at  $20^\circ\text{C}$ , 10s):  $2 \times U_i + 1000$  or  $3000 (V_{AC})$ , whichever value is larger.

**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. If the wave-form with a high distortion rate or frequency is applied across the capacitor, the buzzing noise will become louder. But the buzzing noise 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.

### Storage conditions:

- 1) Capacitors must not be stored in corrosive atmospheres, particularly not when chlorides, sulfides, 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:  $\leq 35^\circ\text{C}$   
 Humidity:  $\leq 80\% \text{ RH}$ , no dew allowed on the capacitor.  
 Storage time:  $\leq 24$  months (from the date marked on the capacitor's body or on the label sticking to the package)

**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 during use of Capacitors:** Do not touch the terminals of capacitors. Keep the capacitor free from conductive solution, such as acids, alkali and so on. Ensure that the operating environment of the equipment into which the capacitor has been built is within the specified conditions mentioned in the catalogue or specification sheets.

**Definition of electrical parameters:** Separate documents as application notes, equivalent circuit diagrams and so on are available on request.

**Packaging:** Please refer to the data book for details. Further information is available on request.