

RoHS
Compliant



SPECIFICATION FOR APPROVAL

File No.: Q/FRK 0.GS.E.C3D-C13

Product Name DC-Link Capacitor for PCB
Product Type: C3D
Product Code D3D2K705KB00C00
Customer
Customer Code
Issue Date 2021-7

Xiamen Faratronic Co. Ltd.			Approved by Customer
Drafted	Checked	Approved	
			



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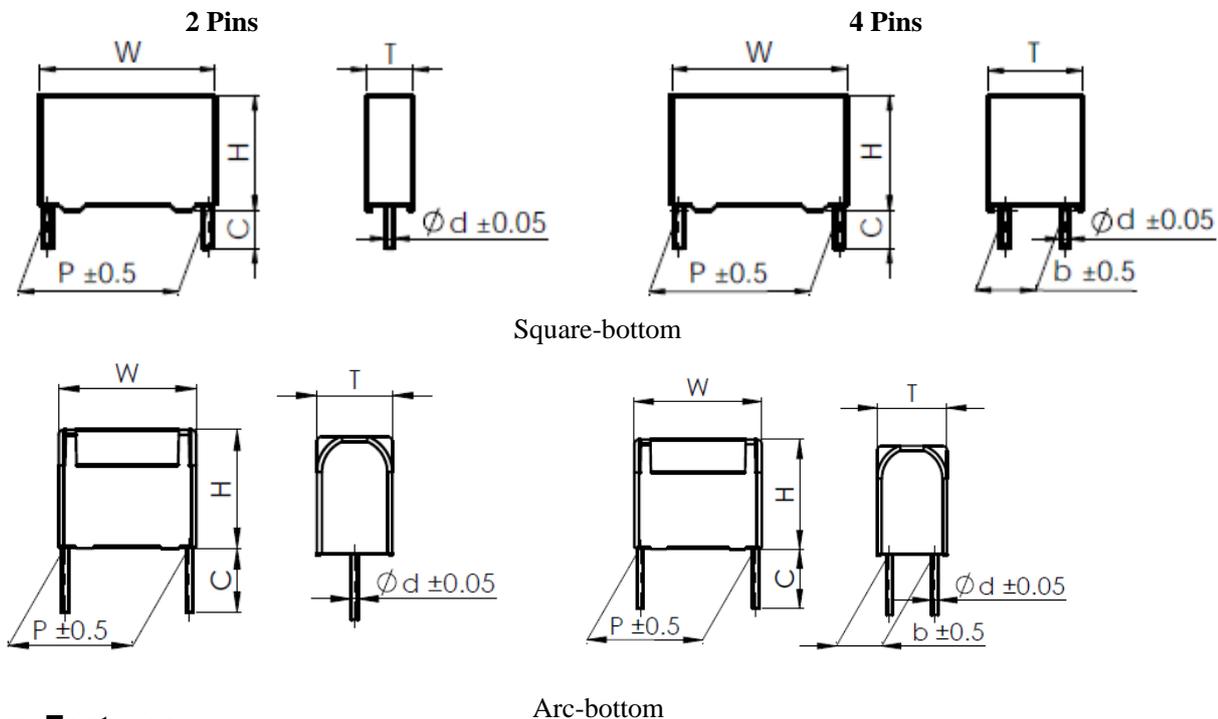


Version history

Current version	Date	Author	Change description

DC-Link Capacitor for PCB

■ Outline Drawing



■ Features

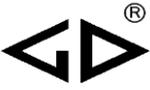
- Metallized polypropylene structure.
- Excellent electric property.
- Plastic case (UL94 V-0), Filled with resin.
- High performance DC filtering applications
(i.e. transducers, Industrial and high-end power supplies and solar inverters)
- AEC-Q200 qualified

■ Safety Approvals

●		TUV Rheinland	EN 61071: 2007, EN 61881-1: 2011, 450Vdc ~ 3200Vdc, 0.56μF~220μF, -40/85°C Certificate No.: R 50266108
●		UL	UL 810 (construction only), Max. 5000Vdc, 90°C File No.: E256238, CCN: CZDS2

■ Specifications

Reference Standard	GB/T 17702 (IEC 61071)
Climatic Category	40/85/56
Operating temperature (case)	-40°C~105°C (+85°C to +105°C: decreasing factor 1.35% per °C for $U_{N, 85^\circ C}$)
$U_{N, 85^\circ C}$	500Vdc, 600Vdc, 800Vdc, 900Vdc, 1 000Vdc, 1 100Vdc, 1 200Vdc
Capacitance Tolerance	J ($\pm 5\%$), K ($\pm 10\%$)
Voltage Proof	1.5 U_N (10s)
Insulation Resistance($IR \times C_N$)	$\geq 10\ 000s$ (20°C, 100V, 1min)
Self Inductance (L_s)	<1nH per mm of lead spacing
Maximum peak current \hat{I} (A)	$\hat{I} = C \cdot dV/dt$
Expected lifetime	100 000h @ U_N , $\theta_{hs} = 70^\circ C$



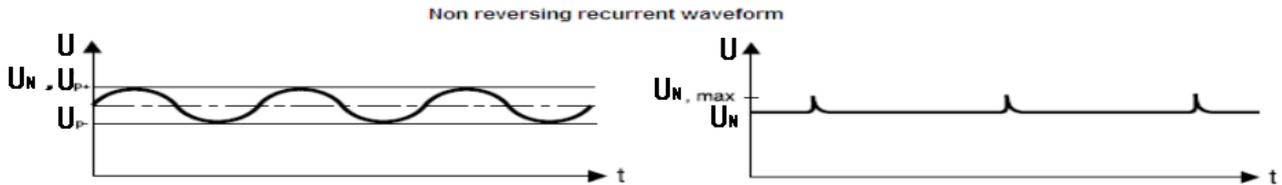
■ Technical data (mm)

U _{N,85°C} : 800Vdc												
C _N (μF)	W ±1.0	H ±1.0	T ±1.0	P ±0.5	b ±0.5	d ±0.05	dV/dt (V/μs)	tanδ × (10 ⁻⁴)		ESR @10kHz (mΩ)	I _{max} (A)	Part number
								1kHz	10kHz			
7.0	32.0	30.0	16.0	27.5	-	0.8	65	10	95	13.0	10.2	D3D2K705KB00C00

Note: 1. "I_{max}"=Maximum r.m.s current at 10kHz, Θ_{amb}=70°C, ΔΘ_{case}=15.0°C.

■ Typical waveforms

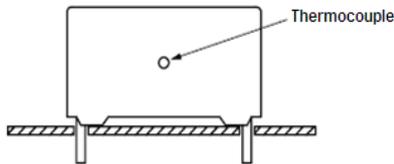
These capacitors are only suitable for DC applications. It means the voltage applied to the capacitors must be unidirectional ripple voltage.



Note:

- The peak voltage(U_{P+}) shall not be greater then the rated DC voltage(U_N).
- The peak-to-peak ripple voltage(U_{P-P}) shall not be greater then $0.3 \times (U_N)$.
- The maximum component surface temperature rise must be lower than 15°C .

■ Measuring the component temperature



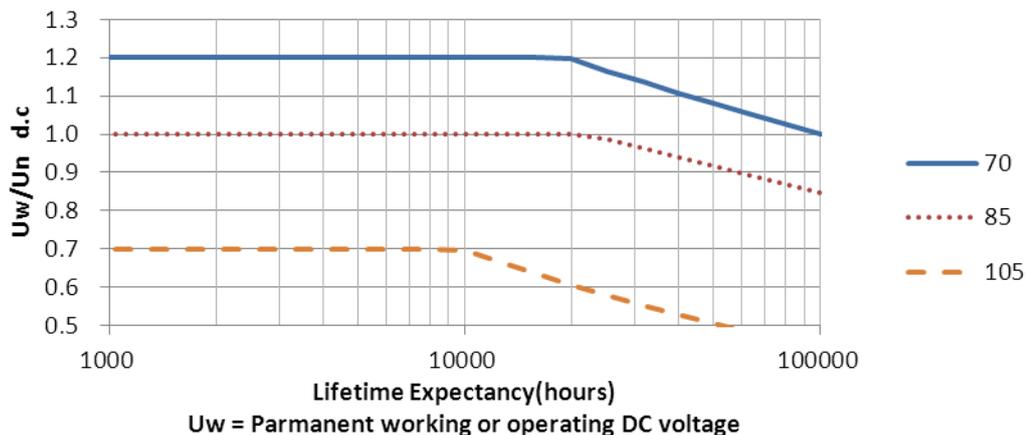
Note:

- The temperature is measured in unloaded (T_{amb}) and maximum loaded condition (T_c)
- The temperature rise is given by $\Delta T = T_c - T_{amb}$
- To avoid thermal radiation or convection, the capacitor must be tested in a closed area from air circulation

■ Over voltages according to IEC 61071:

- 1.1 U_N 30% of on-load-dur.
- 1.15 U_N 30min/day
- 1.2 U_N 5min/day
- 1.3 U_N 1min/day
- 1.5 U_N 100ms every time, 1000 times during the whole life of the capacitor

■ Lifetime expectancy (typical curve)



■ Test Method And Performance

No.	Item	Performance	Testing Method IEC 61071
1	5.14.2 External inspection	Legible marking and finish as specified Dimensions: see specific drawing	Check for finish, marking and overall dimensions
	Initial measurements	Capacitance at 1kHz tgδ at 10kHz	
	5.14.1.1 Robustness of terminations	There shall be no visible damage	Tensile U _{a1} Wire diameter load d ≤ 0.8mm 10N 0.8 mm < d ≤ 1.2mm 20N Bending U _{b1} Wire diameter load d ≤ 0.8 mm 5N 0.8 mm < d ≤ 1.2 mm 10N 4×90°, duration 2s to 3s
	5.14.1.6 Resistance to soldering heat	There shall be no visible damage.	Solder temperature: 260°C ± 5°C Immersion time: 10s ± 1s
	Final measurements	\ΔC/C ≤ 0.5% (relative to the initial value) Increase of tgδ: ≤ 0.005	
2	Initial measurements	Capacitance at 1kHz tgδ at 10kHz	
	5.14.3.1 Vibration	There shall be no evidence damage	f = 10 Hz to 55 Hz a = ± 0.35 mm Test duration per axis = 10 frequency cycles (3 axes offset from each other by 90°C), 1 octave/min, the total times are 135min for 3 axes.
	5.14.3.1 Impacts	There shall be no evidence damage	1 000 times, Acceleration: 390m/s ² Pulse duration: 6ms
	Final measurements	\ΔC/C ≤ 0.5% (relative to the initial value) Increase of tgδ: ≤ 0.005	
3	Initial measurements	Capacitance at 1kHz tgδ at 10kHz	
	5.9 Surge discharge test		Test voltage: 1.1U _{NDC} Number of discharges: 5 Time lapse every 2 min (10min total) Within 5 min after the surge discharge test, the capacitor shall be subjected to a voltage test between terminals: 1.5U _{NDC} , 60s
	Final measurements	\ΔC/C ≤ 1.0% (relative to the initial value) tgδ: ≤ 1.2 × tgδ ₀ (the initial tgδ) + 0.0001	



No.	Item	Performance	Testing Method IEC 61071
4	Initial measurements	Capacitance at 1kHz tgδ at 10kHz	
	5.11 Self-healing		Voltage: 1.5U _{NDC} Duration: 10s If fewer than five clearing occur during this time, the voltage shall be increased slowly until five clearings have occurred since the start of the test or until the voltage has reached 2.5U _{NDC} If fewer than five clearings have occurred when the voltage has reached 2.5U _{NDC} , for a time of 10s, the test shall be finished.
		$ \Delta C/C \leq 0.5\%$ (relative to the initial value) tgδ: $\leq 1.1 \times \text{tg}\delta_0 (\text{the initial tg}\delta) + 0.0001$	
5	Initial measurements	Capacitance at 1kHz tgδ at 10kHz	
	5.13.1 Change of temperature	There shall be no evidence of deterioration	Test: Na θ _A = -40°C, θ _B = +85°C 5 cycles, Duration: t=30min
	Final measurements	$ \Delta C/C \leq 2.0\%$ (relative to the initial value) Increase of tgδ: ≤ 0.015	
6	Initial measurements	Capacitance at 1kHz tgδ at 10kHz	
	5.13.2 Damp heat, steady state	There shall be no evidence of deterioration.	Temperature: 40°C ± 2°C Humidity: 93 ± 3 %RH Duration: 56 days
	5.5.1 Voltage test between terminals	There shall be no permanent puncturing or flashover.	1.5U _{NDC} , 60s
	5.6.1 Voltage test between terminals and case	There shall be no permanent puncturing or flashover.	2 000VAC, 10s
	Final measurements	$ \Delta C/C \leq 2.0\%$ (relative to the initial value) Increase of tgδ: ≤ 0.015	
7	Initial measurements	Capacitance at 1kHz tgδ at 10kHz	
	5.10.1 Thermal stability test	Throughout the last 6h, the temperature of the case near of the top rise shall not increase by more than 1°C	Temperature: ambient temperature Test current: 1.1I _{rms} Test frequency: 10kHz Test time: 48h During the last 6h, the temperature of the case near of the top rise shall be measured per 1.5h.
	Final measurements	$ \Delta C/C \leq 2.0\%$ (relative to the initial value) tgδ: $\leq 1.2 \times \text{tg}\delta_0 (\text{the initial tg}\delta) + 0.015$	

No.	Item	Performance	Testing Method IEC 61071
8	Initial measurements	Capacitance at 1kHz tgδ at 10kHz	
	5.15 Endurance		Measuring procedure: (1) 1.3U _{NDC} , 85°C, 500h (2) Charging and discharging: Times: 1 000 dv/dt: according to the technical data (3) 1.3U _{NDC} , 85°C, 500h
	Final measurements	$ \Delta C/C \leq 3.0\%$ (relative to the initial value) Increase of tgδ: ≤ 0.015	



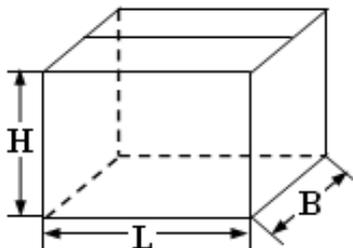
■ Marking(For Example)

Including TUV	Without TUV
 C3D 1100VDC 2.0μF±10% SH 40/85/56 D85E0701234  E256238  EN61071	 C3D 900VDC 85 μF±10% SH 40/85/56 D85E0701234  E256238
 C3D D85E0701234 1100VDC 2.0μF±10% 40/85/56 SH  E256238  EN61071	 C3D D85E0701234 900VDC 85μF±10% 40/85/56 SH  E256238

	Brand	C3D	Type
1100VDC 900VDC	Rated voltage	2.0μF ± 10% 85 μ F ± 10%	Rated capacitance and tolerance
SH	Self-healing capacitor	40/85/56	Climate category
85E0701234	Lot No.		UL Approved
	TUV Approved	E256238	UL Approved File No.
EN61071	TUV apply standard		

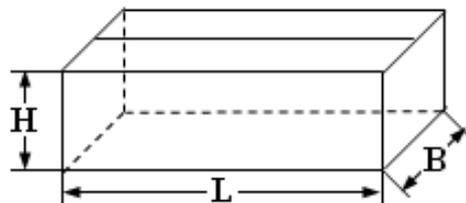
■ Packing box sizes(mm)(example)

1. Out packing box for bulk



L:375±5
B:375±5
H:265±5

2. Inner packing box for bulk



L:355±3
B:175±3
H:118±3