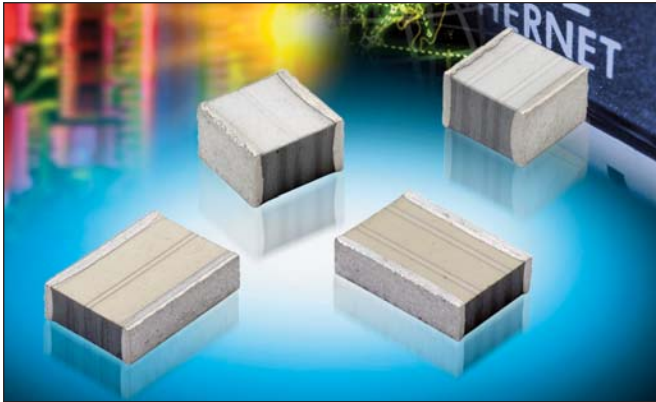


# Film Chip Capacitors



## High Surge Voltage SMD Film Capacitors – CL Series



### GENERAL DESCRIPTION

Film chip capacitor using a naked and stacked construction with metallized Polyethylene Naphtalate film (PEN) Usage of a multitrack technology results to an equivalent serial construction which gives better high voltage surge handling capability.

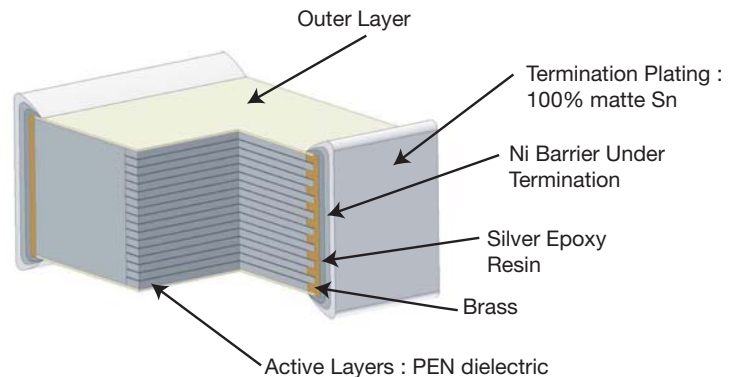
### ADVANTAGES

- Surge Voltage up to 1500V (10/700  $\mu$ s)
- Self healing
- Safe open failure mode
- Low ESR
- Surface Mount (IR/Vapor reflow) solution

### APPLICATIONS

This new version of our High Voltage SMD range has been developed to withstand high line surges common in telecom application.

These capacitors meet the telecom lightning strike protection standards.



### PERFORMANCE CHARACTERISTICS

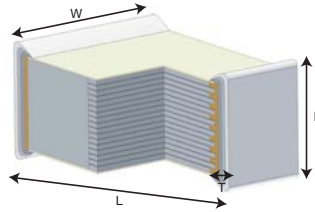
Climatic Category	55/125/56
Capacitance Range	6.8nF to 33nF
Tolerance on $C_R$	$\pm 5\%$ , $\pm 10\%$
Nominal Voltages	630Vdc
Test Voltage	1500V (10/700 $\mu$ sec.)
Soldering methods	IR or vapor phase reflow (not suitable for wave soldering)
Tangent of Loss Angle at 1kHz (DF)	$< 100 \times 10^{-4}$
Insulation resistance minimum: IR	for $C \leq 0.33\mu F$ IR $> 1000 M\Omega$ at 20°C for 1 min.charge at 100VDC
Temperature range	-55°C to 125°C with voltage derating of 1.25%/°C between 105°C and 125°C

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### CAPACITANCE VALUES (CR) AND NOMINAL VOLTAGES (VR)



millimeters (inches)

Capacitance Range (CR)	Ordering Code	VOLTAGE Vdc: 630V											Packaging Unit		Reel Pkg Code
		Chip Dimensions *Tolerances (page 6)				Tape Dimensions			Reel Dimensions						
		L	W	H max	T	W	P1	K0	A	W1	W2 max	Bulk	Reel		
0.0068μF	CL057K0682+ --	7.20 (0.283)	6.10 (0.240)	2.40 (0.094)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	3.80 (0.149)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	1000	2250	BC	
0.0082	CL057K0822+ --	7.20 (0.283)	6.10 (0.240)	2.30 (0.090)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	3.80 (0.149)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	1000	2250	BC	
0.010μF	CL057K0103+ --	7.20 (0.283)	6.10 (0.240)	2.80 (0.110)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	3.80 (0.149)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	1000	2250	BC	
0.012	CL057K0123+ --	7.20 (0.283)	6.10 (0.240)	2.40 (0.094)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	3.80 (0.149)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	1000	2250	BC	
0.015	CL057K0153+ --	7.20 (0.283)	6.10 (0.240)	2.90 (0.114)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	3.80 (0.149)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	1000	2250	BC	
0.018	CL057K0183+ --	7.20 (0.283)	6.10 (0.240)	3.40 (0.134)	0.80 (0.032)	16.0 (0.629)	12.0 (0.472)	3.80 (0.149)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	2250	BC	
0.022	CL957K0223+ --	7.20 (0.283)	10.0 (0.394)	3.00 (0.118)	0.80 (0.032)	16.0 (0.629)	12.0 (0.472)	4.80 (0.189)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	1300	BC	
0.027	CL957K0273+ --	7.20 (0.283)	10.0 (0.394)	3.70 (0.146)	0.80 (0.032)	16.0 (0.629)	12.0 (0.472)	4.80 (0.189)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	1300	BC	
0.033μF	CL957K0333+ --	7.20 (0.283)	10.0 (0.394)	4.00 (0.158)	0.80 (0.032)	16.0 (0.629)	12.0 (0.472)	5.23 (0.206)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	1100	BC	
0.080μF	*CL967K0803+ --	VOLTAGE Vdc: 1000V											400	400	BC
		10.5 (0.413)	9.50 (0.373)	9.10 (0.358)	0.80 (0.032)	24.0 (0.944)	16.0 (0.629)	9.40 (0.369)	330 (12.99)	24.4 (0.961)	30.4 (1.196)				

\*Dedicated for HID lamp applications

For other Values: upon request

Replace the + by the tolerance code: J = 5% or K = 10%

Replace the -- by the packaging suffix: -- = bulk

BC = tape & reel

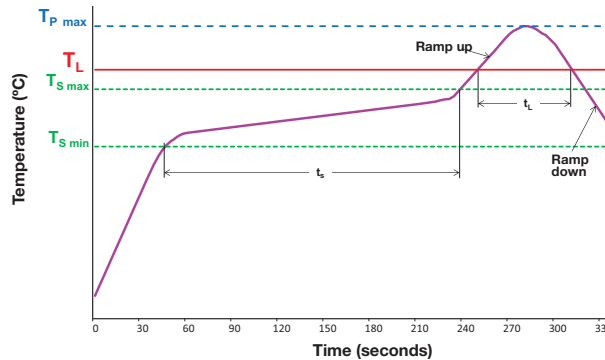
### MOUNTING AND SOLDERING RECOMMENDATIONS

#### SOLDERING PROFILE

The capacitors can be mounted using infrared and vapor phase soldering following recommended below. They are NOT suitable for wave soldering.

All temperature refer to topside of the package, measured on the package body surface.

Profile Feature	2824 to 2840
Ramp-Up ( $T_{s\ max}$ to $T_p$ )	3°C / second max
Preheat	
- Temperature Min ( $T_{s\ min}$ )	150°C
- Temperature Max ( $T_{s\ max}$ )	200°C
- Time ( $t_{s\ min}$ to $t_{s\ max}$ )	180 sec. max
Time maintained above	
- Temperature ( $T_L$ )	217°C
- Time ( $t_L$ )	60 sec. max
Peak temperature ( $T_{p\ max}$ )	255°C
Customer Peak temperature ( $T_p$ )	< 255°C
Time within 5°C of peak temperature ( $T_p - 5^\circ\text{C}$ )*	10 sec.
Ramp-Down	6°C / sec.



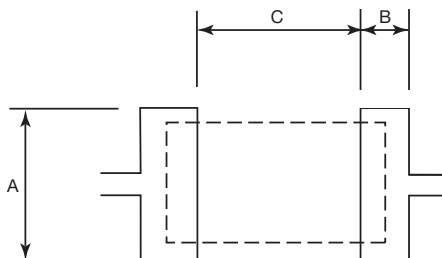
\* Example :  $T_p = 238.5^\circ\text{C} \Rightarrow t_p = \text{time between } 238.5^\circ\text{C and } 233.5^\circ\text{C } (T_p - 5^\circ\text{C})$

# Reflow soldering referring to JEDEC Standard with some limitations  
# JEDEC J-Std 020C

#### RECOMMENDED SOLDER PASTE THICKNESS

For optimum solderability, the recommended soldering paste thickness: 2824: 150 to 200µm  
2840: 200 to 300µm

In case of hand soldering, the temperature of the soldering iron should not be above 250°C. Special care must be taken to avoid touching the capacitor body with the iron tip.



#### PAD DIMENSIONS: millimeters (inches)

Size Code	Case Size	A	B	C
05	2824	6.00 (0.234)	2.50 (0.098)	5.70 (0.224)
95	2840	11.2 (0.440)	2.50 (0.098)	5.70 (0.224)

#### RECOMMENDED CLEANING

To clean flux from the PC board assembly, the recommended products are: ethanol, isopropyl alcohol, and deionized water wash. The cleaning products to avoid are: Toluene, Xylene, Trichloroethylene, Terpene Cleaner EC-7, surface active agent. In case of using another solvent, please contact us.

#### OTHER CAUTIONS

**Flame retardancy:** the dielectric film is not a flame retardant material.

**Environment:** contact us when chips are used in humid or gas atmosphere and /or when using resin.

**Recommended handling:** do not use edged tools, so not to damage the capacitors.

#### TIN WHISKERS TESTS : JEDEC STANDARD NO 22A121

Stress Type	Ref. Spec.	Test Conditions	Analysis	Results
Temperature cycling	JESD22-A104	-55°C +85(+10/-0)°C air 5 to 10mn soak 3 cycles/hour	SEM x 1000	Pass
Ambient Temperature / Humidity Storage		30+/-2°C - 60+/-3% RH -2000H	SEM x 1000	Pass
High Temperature / Humidity Storage		70+/-5°C - 93+3/-2% RH -1000H	SEM x 1000	Pass

# Film Chip Capacitors



## High Surge Voltage SMD Film Capacitors – CL Series – RoHS

### MATERIALS CONTROLLED BY ROHS (PPM BY WEIGHT):

Mass / unit (g)	Lead	Mercury	Cadmium	Hexavalent Chromium	PBB	PBDE
<b>CB range</b>	0	0	0	0	0	0
<b>RoHS Limit (ppm)</b>	1000	1000	100	1000	1000	1000
<b>Pass/Fail</b>	Pass	Pass	Pass	Pass	Pass	Pass

This product has been tested and found to be compliant with all requirements, provisions, and exemptions of EU Directive 2002/95/EC of the European Parliament and Council of January 27, 2003. On the Restriction of use of certain Hazardous Substances (RoHS) in electrical and electronic equipment and EU Directive 2000/53/EC regarding ELV or End of Life Vehicle.

### ROHS / ELV STATUS

External Plating  
100% Matte Sn as standard

### LEAD-FREE STATUS / MOISTURE SENSITIVITY RANKING

Pb Free Reflow Solder compliant, MSL = 3.  
Reflow soldering referring to Jedec Standard with some limitations. Additional JESD-97 data to be phased in MSL e3 termination.

### PRODUCT LABELING:

(For informational purposes only to be phased in on reel and container.)

### PRODUCT TRACEABILITY:

Full internal material traceability by reference to unique lot number marked on reel and external package.

Pb Free:



RoHS Compliant:

