

### FEATURES

- High power,high energy density
- Long cycle life,maintenance-free
- High Operating Voltage
- Lead terminals can be customized
- No Explosion Safety

### APPLICATIONS

- Consumer electronics, Ride thru power support, Back up power,Stand alone or augment existing,energy/power sourceexisting.

### OPERATING TEMPERATURE RANGE

- -40°C to +65°C @6.0V Balanced, 5.5V Unbalanced
- -40°C to +85°C @5.0V Balanced, 4.6V Unbalanced

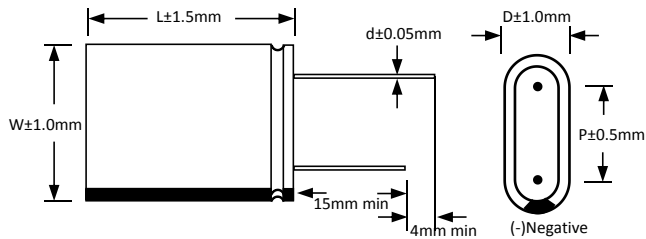


### GENERAL SPECIFICATIONS

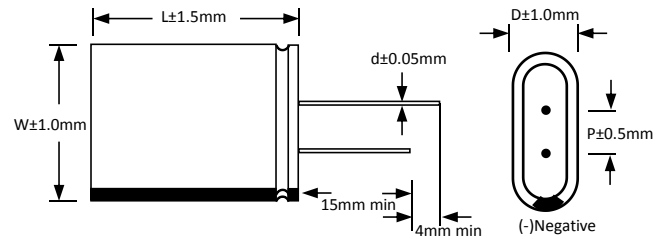
Item	Performance
Operating temperature	-40°C to +65°C
Capacitance range	0.10F to 60F
Capacitance tolerance	-20%~+20% ; -10%~+30%
Rated voltage	6.0 V
Surge voltage	6.2 V
Temperature characteristics	Capacitance change: Within ±30% of initial measured value at +25°C Internal resistance: Within ±200% of initial measured value at +25°C
High temperature load time	After 65°C 1000 hours (at:6.0V): Capacitance change: ±30% of initial rated value Internal resistance: Within 3 times of initial specified value
Projected cycle life (From rated voltage to 1/2 rated voltage at 25°C)	After 500,000 cycles: Capacitance change: Within ±30 % of initial rated value Internal resistance: Within 2 times of initial specified value
Humidity characteristic	Relative humidity: 90%~95% /Duration of testing:240 hrs /Temperature:40±2°C Capacitance change: Within ±30 % of initial rated value Internal resistance: Within 2 times of initial specified value
Vibration resistance	Amplitude:1.5mm /Frequency:10~55Hz /Duration of testing:6 hrs Capacitance change: Within ±30 % of initial rated value Internal resistance: Within 2 times of initial specified value
Shelf life	After 2 years at 25°C without load, the capacitor shall meet the specified endurance limits.

### DIMENSIONS

#### DA Type:



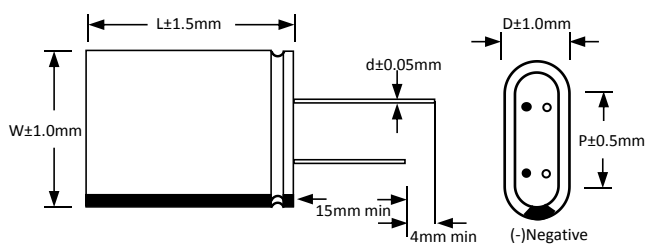
#### DB Type:



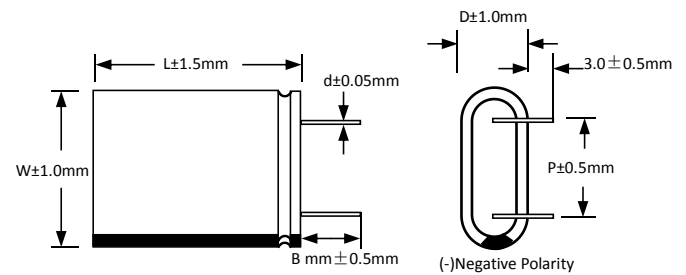
Cell Dia	D	W	P(mm)		$\Phi d$
			DA Type	DB Type	
$\Phi 4.0$	4	12	5.8	2.5	0.5
$\Phi 5.0$	5	12	7.5	3.5	0.5
$\Phi 6.3$	6.3	14	10.0	5.0	0.6
$\Phi 8.0$	8	16	11.5	5.0	0.6
$\Phi 10.0$	10	20	15.5	5.5	0.6
$\Phi 12.5$	12.5	25	17.5	7.5	0.6
$\Phi 16.0$	16	32	24.0	8.5	0.8
$\Phi 18.0$	18	60	26.0	10.5	0.8

\*for version with bent leads

#### DC Type:



#### DZ Type: RADIAL BENT LEAD



Cell Dia	D	W	P(mm)			$\Phi d$
			DC Type	DZ Type	B(mm)	
$\Phi 4.0$	4	12	/	5.8	2.0	0.5
$\Phi 5.0$	5	12	/	7.5	2.0	0.5
$\Phi 6.3$	6.3	14	/	10.0	2.0	0.6
$\Phi 8.0$	8	16	8	11.5	2.0	0.6
$\Phi 10.0$	10	20	10	15.5	2.0	0.6
$\Phi 12.5$	12.5	25	13	17.5	2.0	0.6
$\Phi 16.0$	16	32	16	24.0	2.0	0.8
$\Phi 18.0$	18	60	/	26.0	2.0	0.8

\*for version with bent leads



# CSP(6.0V)Series



www.cda-cap.com

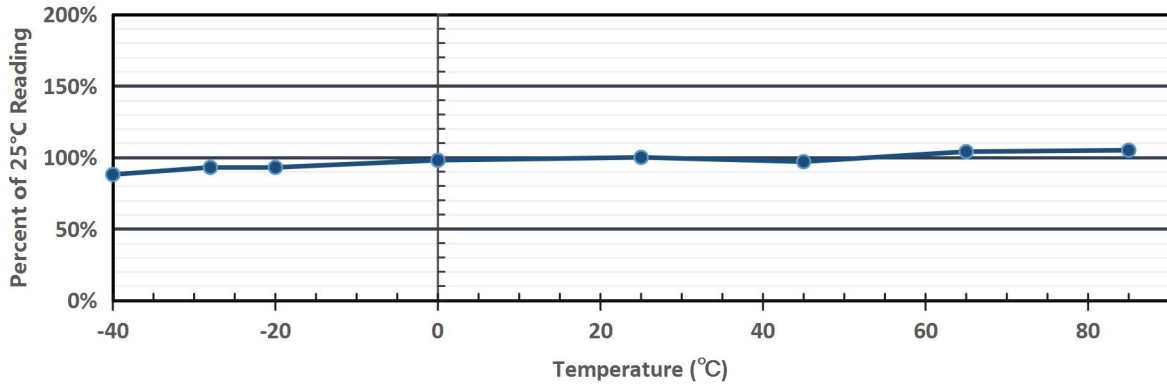
## STANDARD PRODUCTS

Part Number	Rated Voltage (V)	Rated Cap (F)	Size ΦWxDxL (mm)	Max.ESR		Maximum Endurance Current(A)	Maximum Peak Current(A)	Maximum Leakage Current (72hrs/mA)	Power Density (W/Kg)	Maximum Energy (W.h)	Energy Density (Wh/kg)
				ESRAC (1kHz/mΩ)	ESRDC (mΩ)						
<b>6.0V Series-Connected SuperCapacitors Modules(Miniaturized)</b>											
CSP-6R0L104R-TW	6.0	0.1	10*5*12	900	1800	0.10	0.25	0.001	1108	0.0005	0.846
CSP-6R0L124R-TW	6.0	0.12	9*4*12	2000	3600	0.09	0.19	0.001	785	0.0005	0.455
CSP-6R0L224R-TW	6.0	0.22	10*5*14	900	1700	0.15	0.44	0.002	1108	0.0011	0.846
CSP-6R0L224R-TWX	6.0	0.22	13*7*14	400	800	0.18	0.60	0.006	3025	0.0011	1.16
CSP-6R0L474R-TWQ	6.0	0.47	9*4*27	1100	1800	0.18	0.54	0.003	2265	0.0022	1.78
CSP-6R0L504R-TWX	6.0	0.5	13*7*14	400	800	0.16	0.66	0.006	2499	0.0025	1.36
CSP-6R0L155R-TWQ	6.0	1.5	13*7*24	190	380	0.53	2.71	0.010	2880	0.0075	3.00
CSP-6R0L225R-TW	6.0	2.2	13*7*27	190	380	0.56	3.00	0.010	2400	0.0100	3.33
<b>6.0V Series-Connected SuperCapacitors Modules</b>											
CSP-6R0L474R-TW	6.0	0.47	16*8*14	320	480	0.47	1.15	0.007	4286	0.0024	1.12
CSP-6R0L504R-TW	6.0	0.50	16*8*14	350	490	0.50	1.20	0.007	4290	0.0026	1.20
CSP-6R0L105R-TW	6.0	1.0	16*8*18	240	360	0.61	2.21	0.012	4762	0.0050	1.98
CSP-6R0L155R-TWX	6.0	1.5	16*8*18	260	320	0.59	2.84	0.013	3956	0.0075	2.68
CSP-6R0L155R-TW	6.0	1.5	16*8*22	200	300	0.74	3.10	0.014	4729	0.0075	2.46
CSP-6R0L255R-TWX	6.0	2.5	16*8*27	180	270	0.87	4.48	0.018	3907	0.0125	3.05
CSP-6R0L255R-TW	6.0	2.5	20*10*22	150	225	0.97	4.80	0.018	3810	0.0125	2.48
CSP-6R0L305R-TW	6.0	3.0	20*10*22	140	200	0.91	5.80	0.020	4198	0.0175	3.57
CSP-6R0L355R-TW	6.0	3.5	20*10*22	140	200	0.98	6.05	0.020	4198	0.0175	3.57
CSP-6R0L405R-TW	6.0	4.0	20*10*27	120	180	1.20	7.89	0.036	4156	0.0250	4.33
CSP-6R0L405R-TWX	6.0	4.0	25*13*22	120	180	1.20	7.89	0.036	4156	0.0250	4.33
CSP-6R0L505R-TWX	6.0	5.0	25*13*22	90	135	1.42	8.96	0.036	4118	0.0250	3.22
CSP-6R0L505R-TW	6.0	5.0	20*10*27	90	135	1.42	8.57	0.036	4118	0.0250	3.22
CSP-6R0L505R-TWQ	6.0	5.0	20*10*32	120	150	1.52	8.96	0.036	4235	0.0250	3.68
CSP-6R0L755R-TW	6.0	7.5	25*13*27	80	120	1.66	11.84	0.048	4453	0.0375	4.64
CSP-6R0L755R-TWQ	6.0	7.5	25*13*32	90	120	1.75	12.84	0.084	3600	0.0375	3.75
CSP-6R0L755R-TWX	6.0	7.5	25*13*22	80	150	1.35	10.59	0.030	3600	0.0375	4.69
CSP-6R0L106R-TW	6.0	10	25*13*32	70	105	1.93	14.63	0.066	4354	0.0500	5.29
CSP-6R0L106R-TWX	6.0	10	25*13*28	60	120	1.66	13.64	0.050	3428	0.0500	4.76
CSP-6R0L126R-TW	6.0	12.5	32*16*27	50	75	2.41	19.35	0.082	3516	0.0625	3.82
CSP-6R0156R-TW	6.0	15	32*16*32	40	60	2.92	23.68	0.090	3987	0.0750	4.15
CSP-6R0L256R-TW	6.0	25	36*18*42	32	48	3.96	34.09	0.126	3259	0.1250	4.53
CSP-6R0L306R-TW	6.0	30	36*18*42	30	45	4.09	38.30	0.145	3096	0.1500	4.84
CSP-6R0L506R-TW	6.0	50	36*18*62	26	39	5.30	50.85	0.288	2453	0.2500	5.54
CSP-6R0L606R-TW	6.0	60	36*18*62	24	28	5.51	56.96	0.260	2448	0.3000	6.12

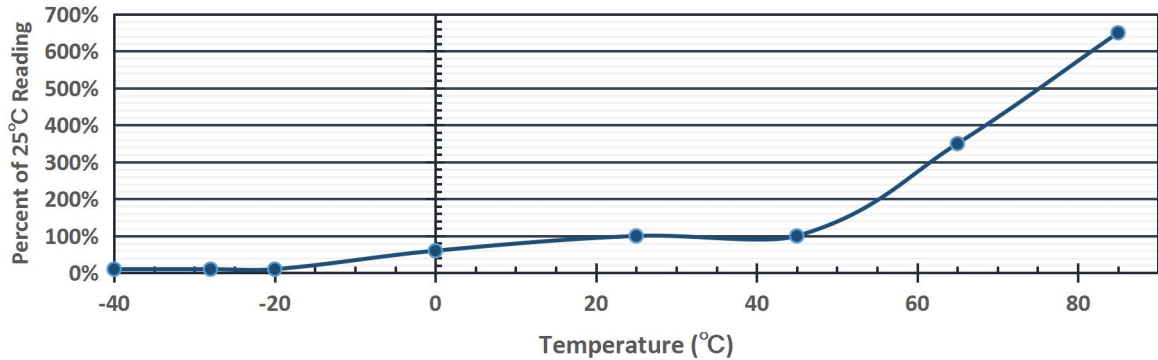
Note: Adds passive balance. Balance options can be provided upon request. Customers can choose according to the application.

### QUALITY AND RELIABILITY

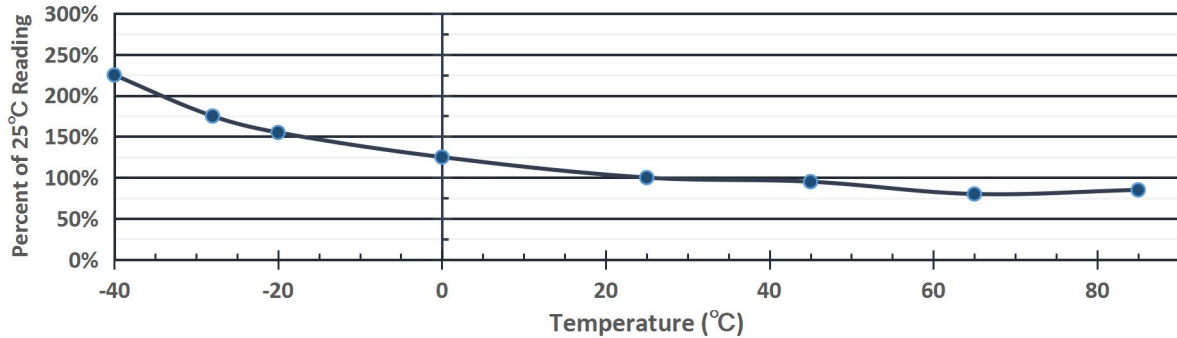
CAPACITANCE VS. TEMPERATURE



LEAKAGE CURRENT VS. TEMPERATURE



EQUIVALENT SERIES RESISTANCE VS. TEMPERATURE



### LIFE TIME AND TEMPERATURE PERFORMANCE

The life of a Super Capacitor is impacted by a combination of operating voltage and the operating temperature according to the following equation :

$$LS = L_R \times 2^X \times 2^Y$$

Which is  $X = (T_m - T_a) / 10$   $Y = (V_r - V_a) / 0.2$

$L_s$  = Expected life of the super capacitor in the application

$L_R$  = Load life rating of the super capacitor

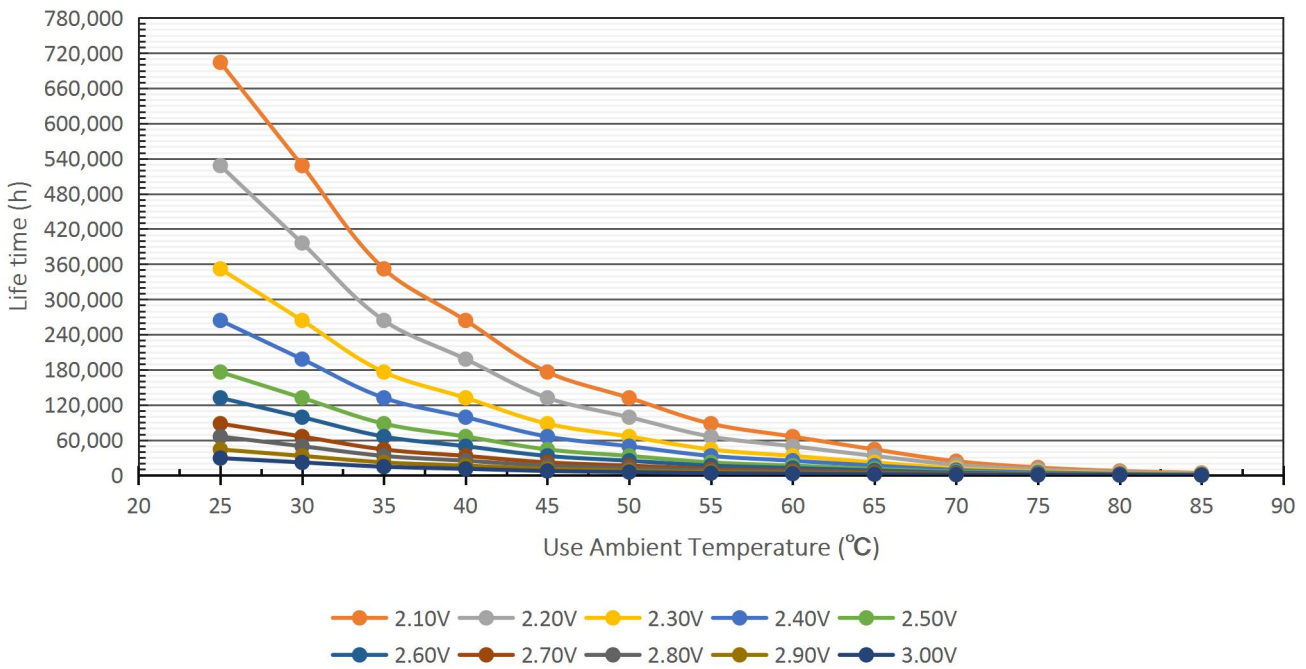
$T_m$  = Max temperature rating of the super capacitor

$T_a$  = Ambient temperature of the application

$V_r$  = Rated voltage of the super capacitor

$V_a$  = Maximum applied voltage on the super capacitor in the application

Expected Lifetime at Various Voltages



## SAFETY RECOMMENDATIONS

### WARNINGS

- To Avoid Short Circuit, after usage or test, SuperCapacitors voltage needs to discharge to  $\leq 0.1V$
- Do not Apply Overvoltage, Reverse Charge, Burn or Heat Higher than  $150^{\circ}C$ , explosion-proof valve may break open
- Do not Press, Damage or disassemble the SuperCapacitors, housing could heat to high temperature causing Burns
- If you observe Overheating or Burning Smell from the capacitor disconnect Power immediately, and do not touch

## PRECAUTIONS FOR WELDING

When soldering supercapacitors to a PCB, the temperature & time that the body of the supercapacitor sees during soldering can have a negative effect on performance. We advise following these guidelines:

- Do not immerse the supercapacitors in solder. Only the leads should come in contact with the solder.
- Ensure that the body of the supercapacitor is never in contact with the molten solder, the PCB or other components during soldering.
- Excessive temperatures or excessive temperature cycling during soldering may cause the safety vent to burst or the case to shrink or crack, potentially damaging the PCB or other components, and significantly reduce the life of the capacitor.

### HAND SOLDERING

Keep distance between the supercapacitor body and the tip of the soldering iron and the tip should never touch the body of the capacitor. Contact between supercapacitor body and soldering iron will cause extensive damage to the supercapacitor, and change its electrical properties. It is recommended that the soldering iron temperature should be less than  $350^{\circ}C$ , and contact time should be limited to less than 4 seconds. Too much exposure to terminal heat during soldering can cause heat to transfer to the body of the supercapacitor, potentially damaging the electrical properties of the supercapacitor.

### REGULATORY

- MSDS
- RoHS Compliant
- Reach Compliant

### TRANSPORTATION

Not subjected to US DOT or IATA regulations  
 UN3499, <10Wh, Non-Hazardous Goods  
 International shipping description –  
 “Electronic Products – Capacitor”

### WAVE SOLDERING

Only use wave soldering on Radial type supercapacitors. The PCB should be preheated only from the bottom and for less than 60 seconds, with temperature at, or below,  $100^{\circ}C$  on the top side of the board for PCBs equal to or greater than 0.8 mm thick.

Solder Temperature ( $^{\circ}C$ )	Suggested Solder Time (s)	Maximum Solder Time (s)
220	7	9
240	7	9
250	5	7
260	3	5

### REFLOW SOLDERING

Infrared or conveyor over reflow techniques can be used on these supercapacitors. Do not use a traditional reflow oven with-out clear rated reflow temperature for supercapacitors.