

FEATURES

- High power, high energy density
- Long cycle life, maintenance-free
- Lead terminals can be customized
- Explosion Safety
- RoHS Directive Compliant

APPLICATIONS

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

OPERATING TEMPERATURE RANGE

- -40°C to +65°C @5.5V Balanced, 5.1V Unbalanced
- -40°C to +85°C @4.6V Balanced, 4.3V Unbalanced

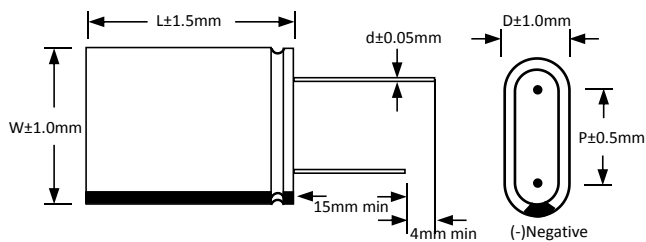
GENERAL SPECIFICATIONS



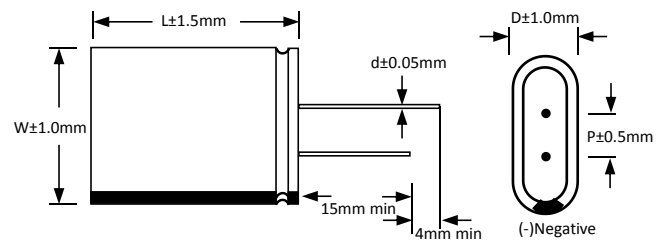
Item	Performance
Operating temperature	-40°C to +70°C
Capacitance range	0.10F to 60F
Capacitance tolerance	-20%to+50%; +0%to+100%; -10%to+30%
Rated voltage	5.0V / 5.5 V
Surge voltage	5.7 V
Temperature characteristics	Capacitance change: Within $\pm 30\%$ of initial measured value at +25°C Internal resistance: Within $\pm 200\%$ of initial measured value at +25°C
High temperature load time	After 70°C 2000 hours Capacitance change: $\pm 30\%$ of initial rated value Internal resistance: Within 2 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 $\pm 30\%$ 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 $\pm$ 2°C Capacitance change: Within $\pm 30\%$ 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 $\pm 30\%$ 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:

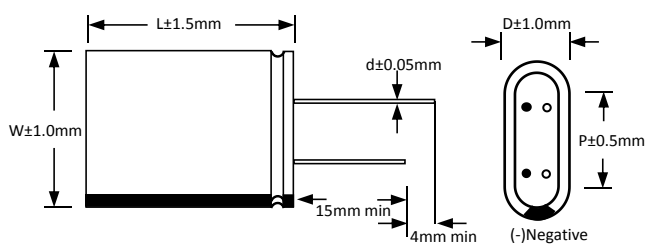


DB Type:

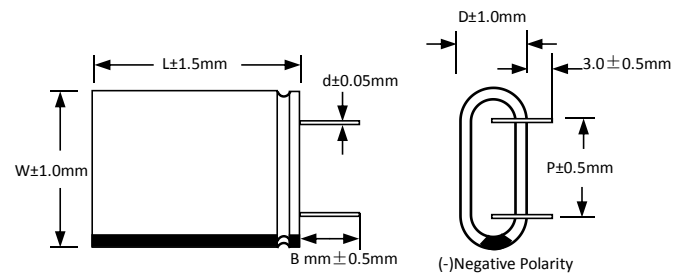


Cell Dia	D	W	P(mm)		Φd
			DA Type	DB Type	
$\Phi 4.0$	4	12	5.8	2.5	0.5
$\Phi 5.0$	5	12	7.5	3.5	0.5
$\Phi 6.3$	6.3	14	10.0	5.0	0.6
$\Phi 8.0$	8	16	11.5	5.0	0.6
$\Phi 10.0$	10	20	15.5	5.5	0.6
$\Phi 12.5$	12.5	25	17.5	7.5	0.6
$\Phi 16.0$	16	32	23.7	8.5	0.8
$\Phi 18.0$	18	60	26.0	10.5	0.8

DC Type:



DZ Type: RADIAL BENT LEAD



Cell Dia	D	W	P(mm)			Φd
			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	8.0	11.5	2.0	0.6
$\Phi 10.0$	10	20	10.0	15.5	2.0	0.6
$\Phi 12.5$	12.5	25	13.0	17.5	2.0	0.6
$\Phi 16.0$	16	32	16.0	23.7	2.0	0.8
$\Phi 18.0$	18	60	20.0	26.0	2.0	0.8

*for version with bent leads

STANDARD PRODUCTS

Part Number	Rated Voltage (V)	Rated Cap. (F)	Size	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)
			ΦWxDxL (mm)	ESRAC (1kHz/mΩ)	ESRDC (mΩ)						
5.0V Series-Connected SuperCapacitors Modules											
CHP5R0L104R-TW	5.0	0.1	10*5*12	2000	3500	0.09	0.17	0.001	660	0.00035	0.38
CHP5R0L474R-TWX	5.0	0.47	13*6.3*14	400	1000	0.31	0.80	0.006	2143	0.0016	1.17
CHP5R0L474R-TW	5.0	0.47	16*8*14	300	1000	0.38	0.86	0.006	2499	0.0016	0.78
CHP5R0L105R-TW	5.0	1.0	16*8*18	200	720	0.45	1.45	0.008	1667	0.0035	1.39
CHP5R0L155R-TW	5.0	1.5	16*8*22	190	580	0.64	2.01	0.010	1669	0.0052	1.68
CHP5R0L255R-TW	5.0	2.5	20*10*22	140	360	0.75	3.29	0.020	1852	0.0087	1.93
CHP5R0L505R-TWX	5.0	5.0	25*12.5*22	100	150	1.10	7.14	0.025	2740	0.0174	2.38
CHP5R0L755R-TW	5.0	7.5	25*12.5*32	70	160	1.52	8.52	0.065	1953	0.0260	2.71
5.5V Series-Connected SuperCapacitors Modules(Miniaturized)											
CHP5R5L104R-TW	5.5	0.1	10*5*12	900	1800	0.09	0.17	0.001	660	0.00042	0.38
CHP5R5L124R-TW	5.5	0.12	9*4*12	2000	3600	0.09	0.17	0.001	693	0.00045	0.38
CHP5R5L224R-TWX	5.5	0.22	10*5*14	800	1500	0.12	0.42	0.002	1117	0.00092	0.92
CHP5R5L224R-TW	5.5	0.22	13*7*14	400	800	0.14	0.60	0.006	3025	0.00092	1.00
CHP5R5L474R-TWQ	5.5	0.47	9*4*27	1100	1800	0.18	0.54	0.003	2046	0.0019	1.78
CHP5R5L504R-TWX	5.5	0.5	13*7*14	400	1000	0.16	0.66	0.006	2499	0.0020	1.36
CHP5R5L155R-TWQ	5.5	1.5	13*7*24	190	380	0.53	2.71	0.010	2880	0.0070	3.00
CHP5R5L205R-TWQ	5.5	2.0	13*7*27	190	380	0.56	3.00	0.010	2400	0.0090	3.33

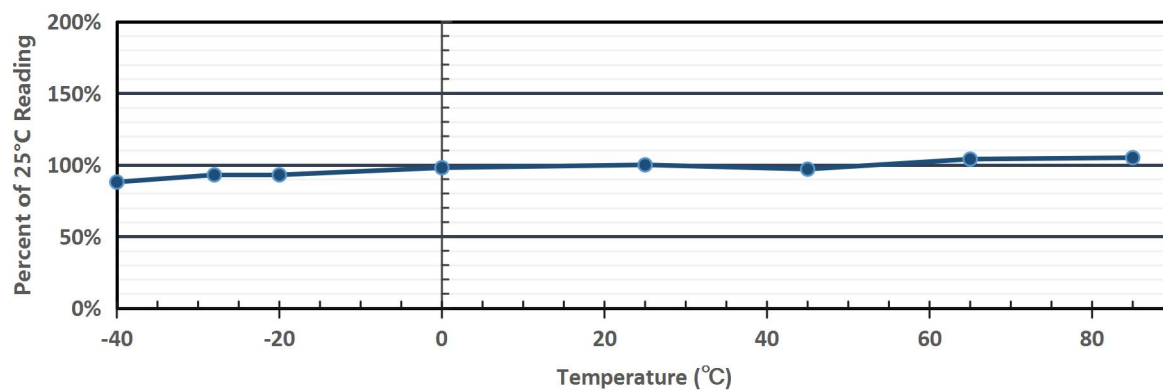
STANDARD PRODUCTS

Part Number	Rated Voltage (V)	Rated Cap. (F)	Size	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)
			ΦWxDxL (mm)	ESRAC (1kHz/mΩ)	ESRDC (mΩ)						
5.5V Series-Connected SuperCapacitors Modules											
CHP5R5L334R- TW	5.5	0.33	16*8*14	300	600	0.34	0.90	0.006	3084	0.0019	1.00
CHP5R5L474R-TW	5.5	0.47	16*8*14	300	600	0.47	1.05	0.006	3601	0.0019	0.91
CHP5R5L504R-TW	5.5	0.50	16*8*14	300	600	0.50	1.05	0.006	3184	0.0020	1.00
CHP5R5L105R-TW	5.5	1.0	16*8*14	360	540	0.44	1.79	0.006	2923	0.0042	1.83
CHP5R5L105R-TWX	5.5	1.0	16*8*18	240	360	0.61	2.02	0.010	4201	0.0042	1.75
CHP5R5L105R-TWQ	5.5	1.0	16*8*22	200	400	0.74	2.12	0.012	4172	0.0042	2.05
CHP5R5L155R-TW	5.5	1.5	16*8*22	200	300	0.74	2.84	0.012	4172	0.0063	2.17
CHP5R5L155R-TWX	5.5	1.5	16*8*18	260	320	0.59	2.60	0.012	3723	0.0063	2.52
CHP5R5L205R-TW	5.5	2.0	16*8*22	200	300	0.74	3.38	0.015	3307	0.0100	2.17
CHP5R5L255R-TW	5.5	2.5	20*10*22	150	225	0.97	4.40	0.015	3361	0.0105	2.19
CHP5R5L255R-TWX	5.5	2.5	20*10*18	180	270	0.80	4.10	0.015	3056	0.0105	2.39
CHP5R5L255R-TWQ	5.5	2.5	16*8*27	160	330	0.75	4.05	0.017	3045	0.0103	2.85
CHP5R5L305R-TW	5.5	3.0	20*10*22	150	225	0.97	4.93	0.020	3361	0.0126	2.63
CHP5R5L355R-TW	5.5	3.5	20*10*22	150	225	0.97	5.38	0.020	3361	0.0147	3.06
CHP5R5L355R-TWQ	5.5	3.5	16*8*27	120	180	1.20	5.90	0.020	3667	0.0147	3.06
CHP5R5L405R-TW	5.5	4.0	20*10*27	150	315	1.17	5.35	0.028	2063	0.0147	2.70
CHP5R5L405R-TWX	5.5	4.0	25*12.5*22	90	135	1.42	8.21	0.030	3634	0.0210	2.84
CHP5R5L505R-TW	5.5	5.0	20*10*27	150	315	1.17	5.35	0.028	2063	0.0147	2.70
CHP5R5L505R-TWX	5.5	5.0	25*12.5*22	90	135	1.42	8.21	0.030	3634	0.0210	2.84
CHP5R5L505R-TWQ	5.5	5.0	20*10*32	90	135	1.51	8.21	0.030	4074	0.0210	3.18
CHP5R5L755R-TW	5.5	7.5	25*12.5*28	100	160	1.80	10.66	0.070	3359	0.0152	3.50
CHP5R5L755R-TWQ	5.5	7.5	25*13*32	70	105	1.93	11.54	0.052	3841	0.0315	3.50
CHP5R5L106R-TW	5.5	10	25*12.5*28	96	140	1.95	11.25	0.055	3362	0.0315	4.20
CHP5R5L106R-TWQ	5.5	10	25*13*32	70	105	1.93	13.42	0.055	3841	0.0420	4.67
CHP5R5L106R-TWX	5.5	10	25*13*37	60	90	2.23	14.47	0.056	3507	0.0420	3.65
CHP5R5L126R-TW	5.5	12	32*16*27	50	75	2.41	17.74	0.068	3103	0.0525	3.37
CHP5R5L156R-TW	5.5	15	32*16*32	70	120	2.09	15.00	0.095	1952	0.0525	3.40
CHP5R5L206R-TW	5.5	20	36*18*42	36	54	3.52	26.44	0.088	2988	0.0840	3.73
CHP5R5L206R-TWX	5.5	20	36*18*37	43	72	3.1	20.54	0.080	2345	0.0735	3.65
CHP5R5L256R-TW	5.5	25	36*18*42	40	60	4.34	27.50	0.110	2161	0.1050	3.80
CHP5R5L306R-TW	5.5	30	36*18*42	35	50	4.64	33.00	0.120	2503	0.1260	4.30
CHP5R5L416R-TW	5.5	41	36*18*42	45	60	3.55	31.53	0.250	1897	0.1300	4.80
CHP5R5L506R-TW	5.5	50	36*18*62	30	45	6.04	42.31	0.300	1939	0.2101	5.00
CHP5R5L606R-TW	5.5	60	36*18*62	25	40	7.20	50.47	0.25	2047	0.1910	5.90

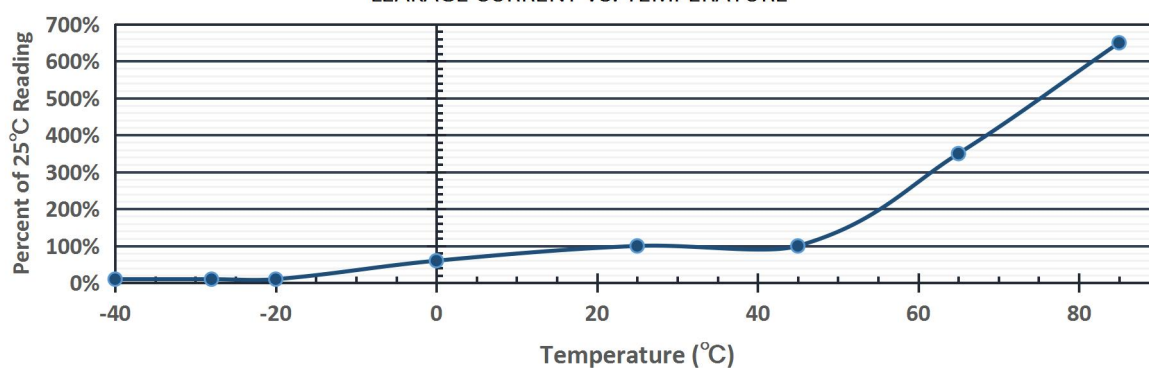
Note: Adds passive balance. Balance options can be provided upon request. Customers can choose according to the application.

QUALITY AND RELIABILITY

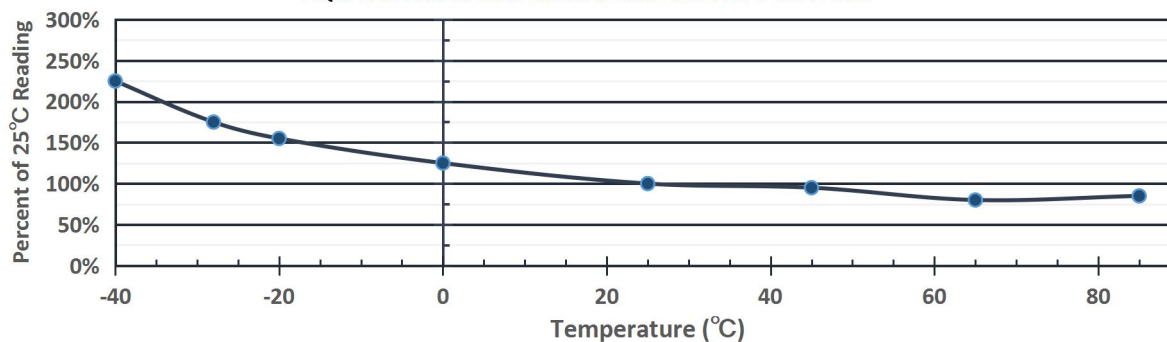
CAPACITANCE VS. TEMPERATURE



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

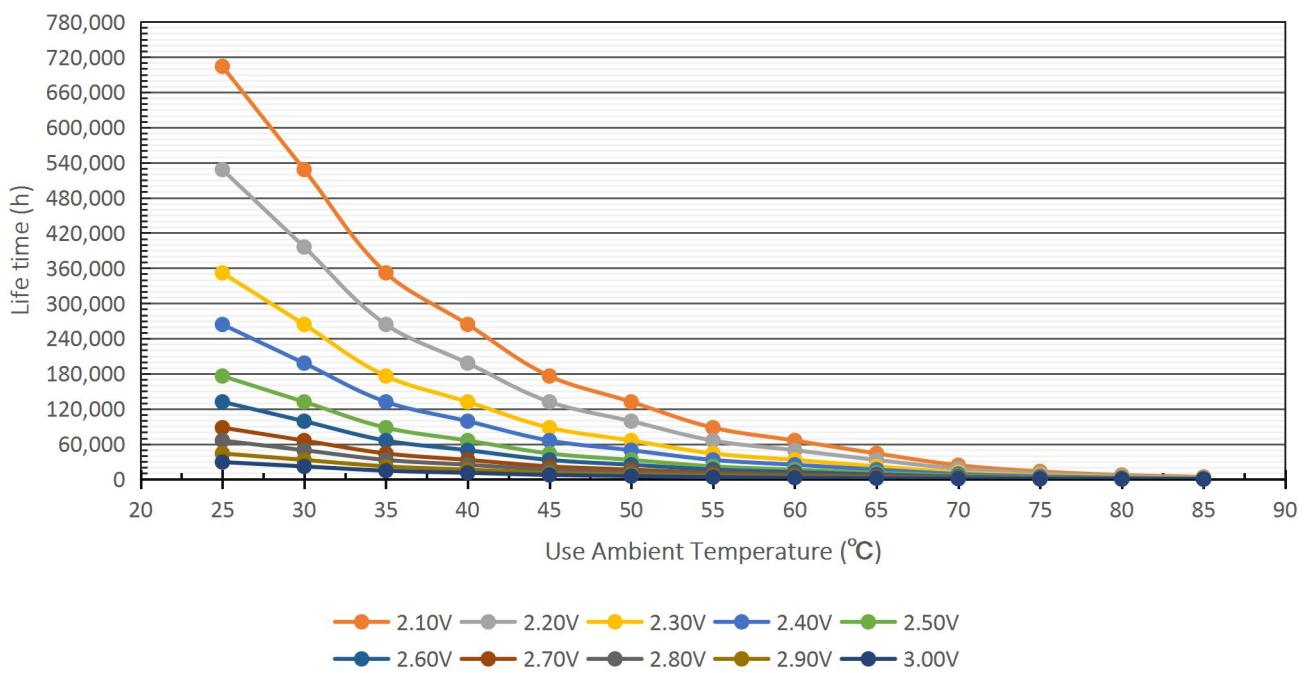
T_m = Max temperature rating of the super capacitor

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 Over voltage, Reverse Charge, Burn or Heat Higher than $150^{\circ}C$, explosion-proof valve may break open
- Do not Press, Damage or disassemble the SuperCapacitor, 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

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”

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.

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.