DSF Series Supercapacitors

Higher Voltage, Low ESR Supercapacitors…
1.5 to 600 Farads!

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ENERGIZING IDEAS

DSF Series Supercapacitors offer higher voltage for higher power

- Rated for 3 WVDC, or 6 WVDC for dual pack, as compared to typical supercaps, which have a single device rating of 2.5-2.7 WVDC.
- Higher full-rated operating voltage results in greater energy densities, which leads to space savings.
- High current handling—up to 20 amps.
- Ideal for a variety of energy-storage applications.

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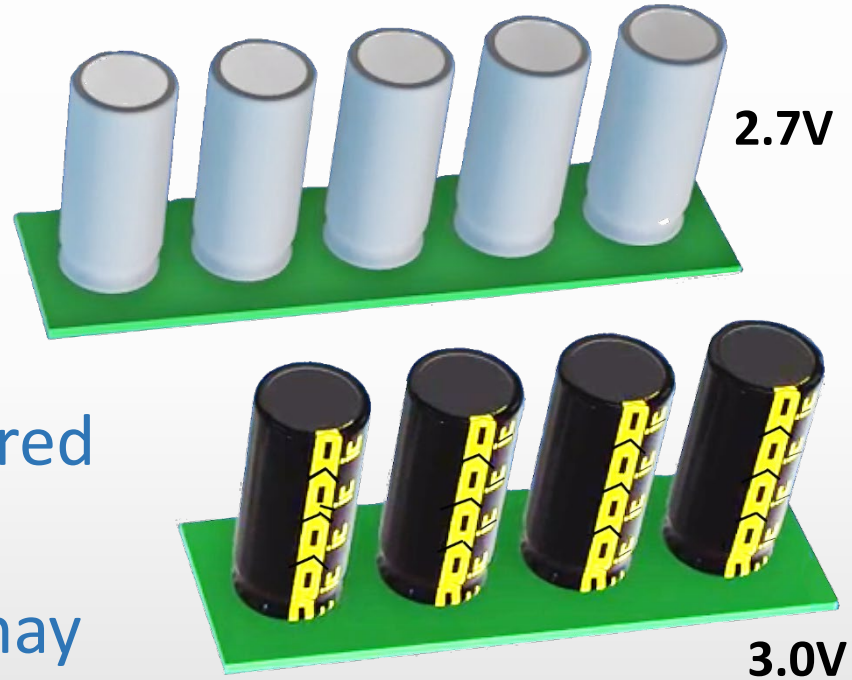
Use fewer devices in capacitor banks!

- Bank in series or parallel for even higher voltage or capacitance.
- Because of its higher voltage and power density, fewer DSF capacitors may be required in banks, saving space and cost.
- Graphic shows how fewer DSF capacitors may be required, compared to other supercaps.
- Energy density is 24% greater than a 2.7V device.



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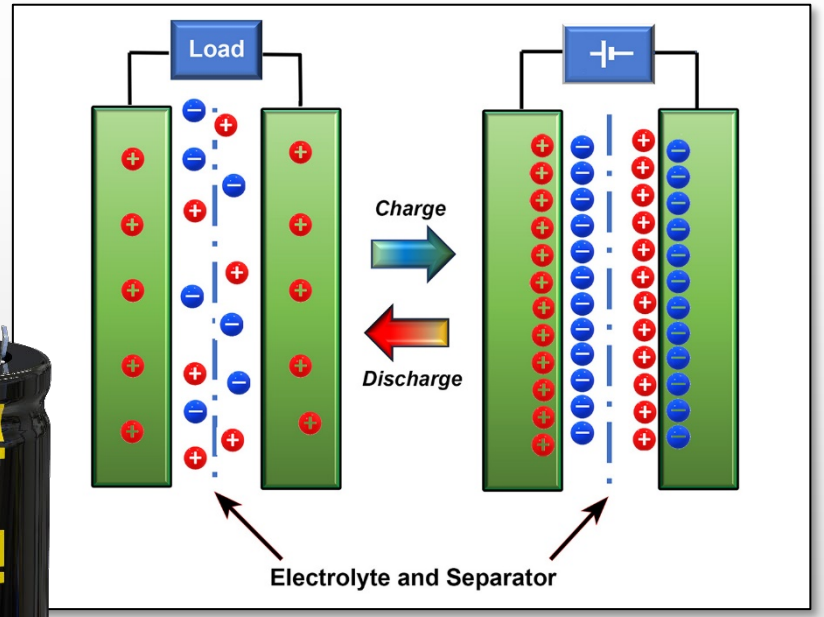
Like other supercapacitors, the DSF Series offers far greater capacity than conventional electrolytics

Compared to electrolytics or rechargeable batteries, the DSF Series is…

- An electric double-layer capacitor (EDLC), with very large storage capabilities and low ESR.
- Designed around an activated carbon anode and cathode, with an organic electrolyte.
- Especially suitable for short, high-power output and energy storage applications.
- Instant charging, with long life energy storage.



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DSF Series supercapacitors offer high performance plus cost savings

- Values from 1.5 to 600 Farads
- 3.0 or 6.0 WVDC Max
- Low ESR and high current handling
- -40 °C to +85 °C operating temperature
  (-40 °C to 65 °C at 3.0 WVDC)
- Operating life: 10 years with 500,000 cycles
- Performance does not degrade with each cycle
- Value priced

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DSF Series key specifications summary

Operating Temperature Range	**-40°C to +85°C**	
Storage Temperature	**+5°C to +35°C**	
Capacitance Tolerance @ 20°C	**-10% +30%**	
Voltage (Vdc) (+65°C/+85°C)	**3.0V / 2.5V**	
Life Time	**1500 hours with rated voltage applied at rated temperature**	
	Capacitance change	±30% of initially measured values
	ESR	<200% of initially specified values*
	Leakage current	≤100% specified maximum value
Shelf Life	**1000 hours with no voltage applied at 60°C**	
	Capacitance change	±30% of initially measured values
	ESR	<200% of initially specified values
Life Cycles (25°C) 1 cycle= Charge to WVDC for 20s, constant voltage charging for 10s, discharge to ½ WVDC for 20s, rest for 10s	**500,000 cycles**	
	Capacitance change	±30% of initially measured values
	ESR change	<200% of initially specified values

*ESR change ≤4x at 85°C

- 6 volt rated caps are radials, internally constructed of two devices in series.

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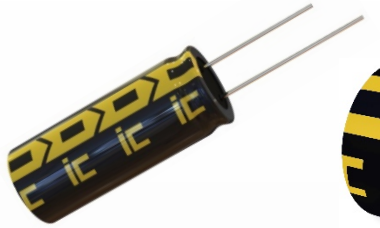
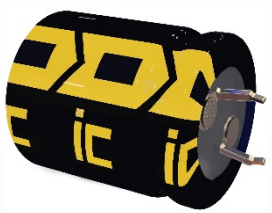
Choose from 17 different SKUs…1.5 to 600 Farads





WVDC	Capacitance (F)	IC PART NUMBER	MAX Current (A) (1 Sec.)	Maximum Continuous Current (A) (ΔT=15°C)	Short Circuit Current (A)	ESR AC 1 kHz (mΩ)	DC ESR (mΩ) 20°C	Max stored energy (mWh)	LC (mA), (72 hrs)	Energy Density (Wh/kg)	Energy Volumetric Density (Wh/l)	Power Density (kW/kg)	Power Volumetric Density (kW/l)
3	3.0	DSF305Q3R0	3.1	1.4	20	80	150	3.75	0.014	2.67	3.71	5.14	6.6
3	5.0	DSF505Q3R0	4.5	2.2	23	70	130	6.25	0.02	2.97	3.98	3.95	5.29
3	7.0	DSF705Q3R0	6.7	2.4	38	55	80	8.75	0.03	3.8	4.46	5.86	6.88
3	10.0	DSF106Q3R0	9.4	3.4	50	40	60	12.5	0.045	3.9	5.29	5.625	7.62
3	25.0	DSF256Q3R0	20	4.4	86	25	35	31.25	0.1	4.46	6.21	4.4	6.13
3	50.0	DSF506Q3R0	35.7	7.1	136	15	22	62.5	0.15	4.88	6.14	3.83	4.82
3	100.0	DSF107Q3R0	68.2	8.3	250	8	12	125	0.3	5.95	7.31	4.29	5.26
3	110.0	DSF117Q3R0	59.8	6.3	188	10	16	137.5	0.21	6.25	9.005	3.07	4.421
3	200.0	DSF207Q3R0	100	10	300	6	10	250	0.7	6.94	7.07	3	3.06
3	350.0	DSF357Q3R0	236	18.9	857	3	3.5	437.5	1	6.73	7.58	4.75	5.35
3	400.0	DSF407Q3R0	250	18.9	857	3	3.5	500	1	7.35	8.66	4.96	5.85
3	470.0	DSF477Q3R0	267	18.9	857	3	3.5	587.5	1.3	8.05	10.18	4.23	5.35
3	600.0	DSF607Q3R0	290	20	857	3	3.5	750	1.5	9.15	11.14	4.12	5.35
6	1.5	DSF155Q6R0HAE	3.1	1.4	20	180	320	7.5	0.013	2.5	2.52	16.6	16.8
6	2.5	DSF255Q6R0JBE	4.5	2.2	23	160	280	12.5	0.018	3.1	2.51	14.1	11.3
6	3.5	DSF355Q6R0JBF	6.7	2.4	38	130	180	17.5	0.025	3.5	3	13.8	11.9
6	5.0	DSF505Q6R0JBG	9.4	3.4	50	100	140	25	0.04	3.57	3.62	12.9	13

- Up to 110F in a radial-leaded package.
- 100 to 600F types are snap-ins.

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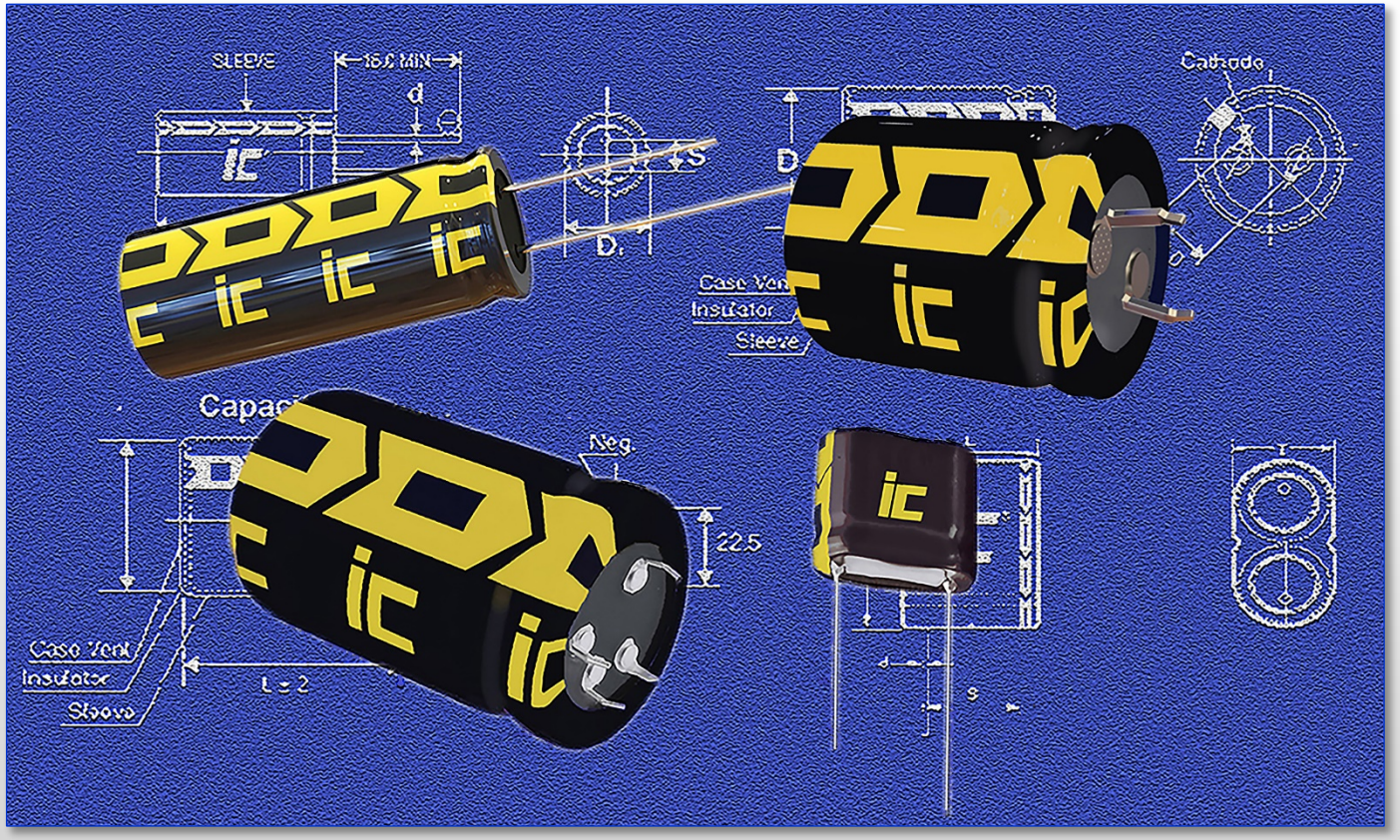
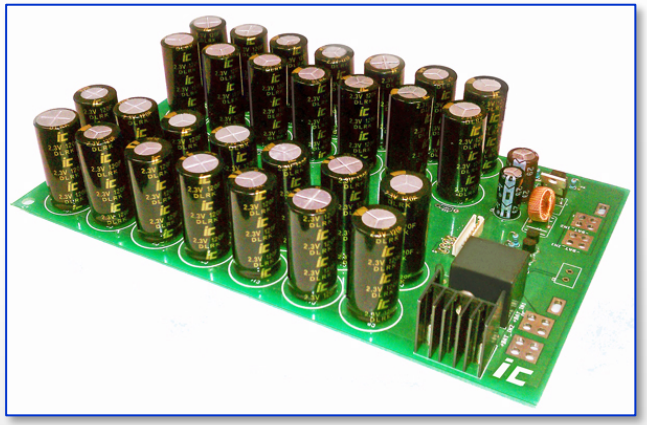
Configurations and termination options

DSF has four lead configurations, which vary by voltage and capacitance: radial, two-pin snap in, four-pin snap in and dual pack.





High-Voltage, High-Capacity Custom Module Example

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DSF Series potential applications

- Industrial
  - Factory automation and robotics
  - Cranes, elevators
  - Mechanical actuator power
- Transportation
  - Forklift trucks
  - Personal electric vehicles
- Energy/Lighting
  - Smart utility meters
  - UPS systems and emergency lighting
  - Solar lights and energy storage
  - Power conversion
- IoT
  - Energy harvesting/storage
- Memory Backup Circuits

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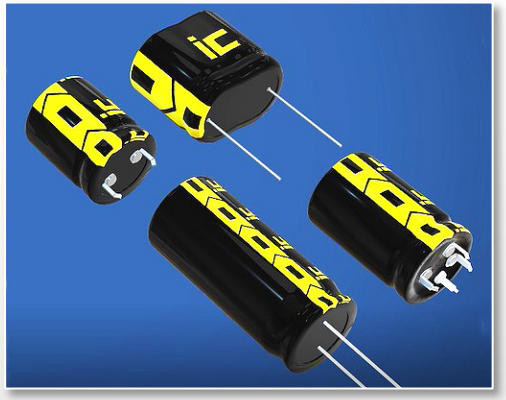
DSF Series performance summary

DSF Supercapacitors provide very high capacitance and energy storage, higher operating voltages, higher current and low cost.



- Standard values from 1.5 to 600 Farads at 3.0 or 6.0 WVDC
- -40 °C to +85 °C operation (-40 °C to 65 °C at 3.0 WVDC)
- Low ESR with high current handling
- 10 year/500,000 cycle life exceeds typical end-product life
- Unlike batteries, performance does not degrade with each charge/discharge cycle
- Very compact size and high energy density aids product design flexibility
- Bank in series or parallel for higher capacitance or voltage

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