

Low-ESR, Low-Cost Supercapacitors Offer Values Up To 600 F

CDE has expanded its Illinois Capacitor brand DGH series of low-ESR, low-cost supercapacitors to include capacitance values up to 600 F. The series includes 24 different capacitance and voltage combinations, ranging from 0.5 F to 600 F, with voltage ratings from 2.7 to 5.5 WVdc (see the table and the figure).

These supercaps also offer an operating temperature range of -40°C to 65°C at maximum WVdc, or from -40°C to 85°C at 2.3 V. Multiple devices can be banked in parallel or series for even higher voltage or capacitance. DGH supercaps can discharge instantaneous bursts of power to smooth power interruptions, supplement batteries, or even replace batteries in certain applications. At 2.7 V, operating life is rated at 10 years with 500,000 charge/discharge cycles.

Applications for these supercapacitors include energy harvesting, IoT systems, mechanical actuators, transportation power, smart electric meters, pulse battery pack alternatives, memory backup, battery and capacitor hybrids, UPS systems, emergency lighting, LED power, solar lighting and many other devices requiring maximum energy storage in minimum space.

The DGH series is available from stock at major distributors. Custom modules, with active or passive balancing, are also available, to meet higher voltage or capacitance requirements. For more information, see the DGH series [page](#) or the [datasheet](#).

Table. The DGH series includes 24 capacitance-voltage combinations, from 0.5 F to 600 F and 2.7 to 5.5 WVdc.

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)
2.7	1.0	DGH105Q2R7	0.96	0.6	6.8	200	400	1.01	0.008	0.92	1.44	1.988	3.109
2.7	2.0	DGH205Q2R7	1.8	0.7	11	130	250	2.03	0.01	1.688	2.879	2.916	4.975
2.7	3.0	DGH305Q2R7	2.8	1.2	18	80	150	3.04	0.012	2.17	3.023	4.166	5.804
2.7	3.3	DGH335Q2R7	3	1.2	18	80	150	3.34	0.014	2.228	3.325	3.888	5.804
2.7	5.0	DGH505Q2R7	4.1	1.3	21	70	130	5.06	0.016	2.531	3.225	3.365	4.286
2.7	6.0	DGH605Q2R7	4.6	2.3	21	70	130	6.08	0.016	2.89	3.86	3.2	4.3
2.7	7.0	DGH705Q2R7	6.1	1.7	34	55	80	7.09	0.02	2.835	3.611	4.374	5.572
2.7	10.0	DGH106Q2R7	8.4	3.5	45	40	60	10.13	0.03	3.894	5.159	5.608	7.429
2.7	10.0	DGH106Q2R7B	8.4	3.5	45	40	60	10.13	0.03	2.978	4.299	4.288	6.191
2.7	10.0	DGH106Q2R7C	8.4	3.5	45	40	60	10.13	0.03	3.38	5.16	4.86	7.4
2.7	15.0	DGH156Q2R7	11.6	2.4	54	30	50	15.19	0.045	3.375	4.127	3.888	4.755
2.7	20.0	DGH206Q2R7	15	2.6	68	30	40	20.25	0.06	3.11	4.02	3.36	4.3
2.7	25.0	DGH256Q2R7	18	3.1	77	25	35	25.31	0.08	2.978	5.038	2.941	4.975
2.7	30.0	DGH306Q2R7	21.3	4.0	90	22	30	30.38	0.1	3.79	5.03	3.64	4.8
2.7	50.0	DGH506Q2R7	32.1	5.2	123	15	22	50.63	0.14	3.616	4.976	2.84	3.909
2.7	70.0	DGH706Q2R7	39.4	5.8	135	14	20	70.88	0.16	3.938	5.573	2.43	3.439
2.7	100.0	DGH107Q2R7	61.4	8.3	225	8	12	101.25	0.3	4.821	5.922	3.471	4.264
2.7	200.0	DGH207Q2R7	90	10	270	6	10	202.5	0.7	5.192	5.732	2.243	2.476
2.7	350.0	DGH357Q2R7	212	18.9	771	3	3.5	354.38	1	5.452	6.134	3.845	4.329
2.7	350.0	DGH357Q2R7L	212	18.9	771	3	3.5	354.4	1	5.452	6.134	3.845	4.329
2.7	400.0	DGH407Q2R7	225	18.9	771	3	3.5	405	1	5.956	7.016	4.02	4.736
2.7	470.0	DGH477Q2R7	240	18.9	771	3	3.5	475.88	1.3	6.609	8.244	3.471	4.33
2.7	600.0	DGH607Q2R7	261	18	771	3	3.5	608	1.5	7.41	9.02	3.05	3.71
5.5	0.5	DGH504Q5R5	0.96	0.6	6.8	400	800	2.1	0.008	0.955	0.855	2.063	1.847
5.5	1.0	DGH105Q5R5	1.8	0.7	11	260	500	4.2	0.01	1.681	1.71	2.904	2.955
5.5	1.5	DGH155Q5R5	2.8	1.2	18	160	300	6.3	0.012	2.101	1.896	4.033	3.641
5.5	2.5	DGH255Q5R5	4.1	1.3	21	140	260	10.5	0.016	2.02	1.977	2.685	2.628
5.5	3.5	DGH355Q5R5	6.1	1.7	34	110	160	14.71	0.02	2.451	2.358	3.781	3.638
5.5	5.0	DGH505Q5R5	8.4	3.5	45	80	120	21	0.03	2.531	2.302	3.645	3.315

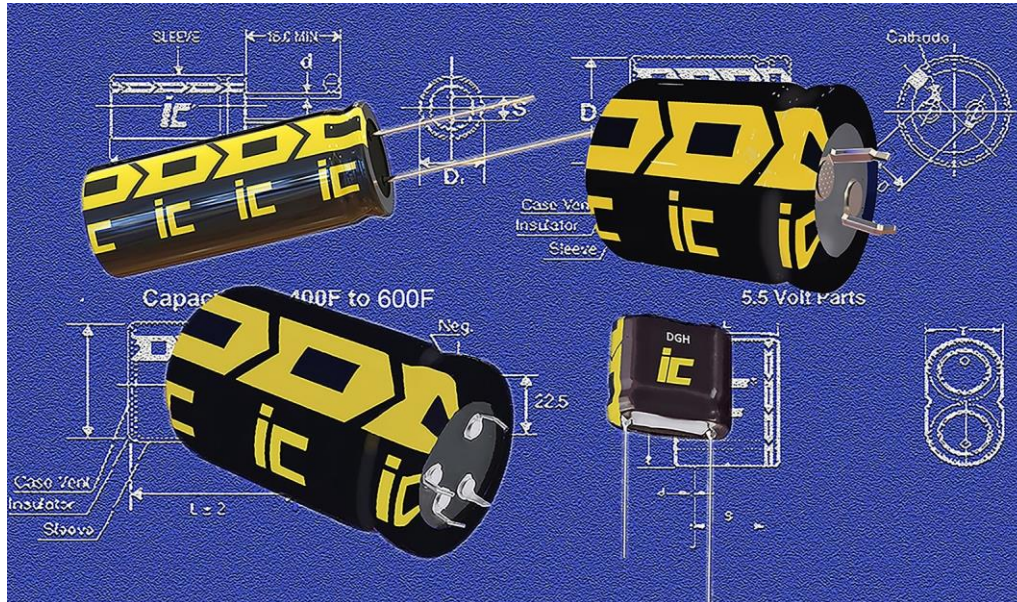


Figure. In this series, radial, two-pin snap-in, four-pin snap-in, and dual-pack configurations are available, depending on voltage and capacitance combinations. Likewise, case diameters and configurations vary, depending on values. Parts are also fully RoHS compliant.