

**CAPACITORS FOR  
POWER ELECTRONIC APPLICATIONS  
INDUCTION EQUIPMENT  
ENERGY STORAGE**

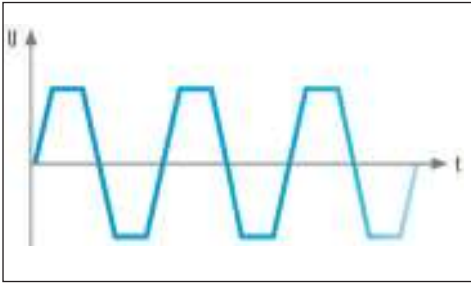


**MADE IN ITALY**

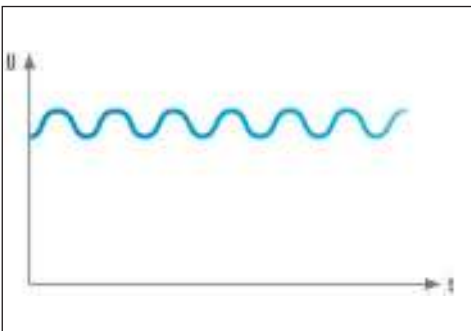


**WWW.GRUPPOENERGIA.IT**

Typical AC application voltage characteristics



Typical DC application voltage characteristics



**APPLICATION**

Capacitors for power electronics can be used for a wide range of applications, even in case of extreme non-sinusoidal voltages and pulsed currents. They are used in frequency converters/inverters (traction drives, wind and solar power systems). Input/output reactors are also available and manufactured by Gruppo Energia.

Gruppo Energia produces both AC and DC capacitors. Generally AC capacitors are being periodically recharged during operation while DC capacitors are being periodically charged and discharged without recharge.

This phenomenon is particularly dangerous for capacitors since their impedance decreases proportionally to the level of the harmonics with consequent capacitor overload. This significantly shortens their life. In some situations, resonance effect can occur as a result of amplification of harmonic currents and a very high voltage distortion.

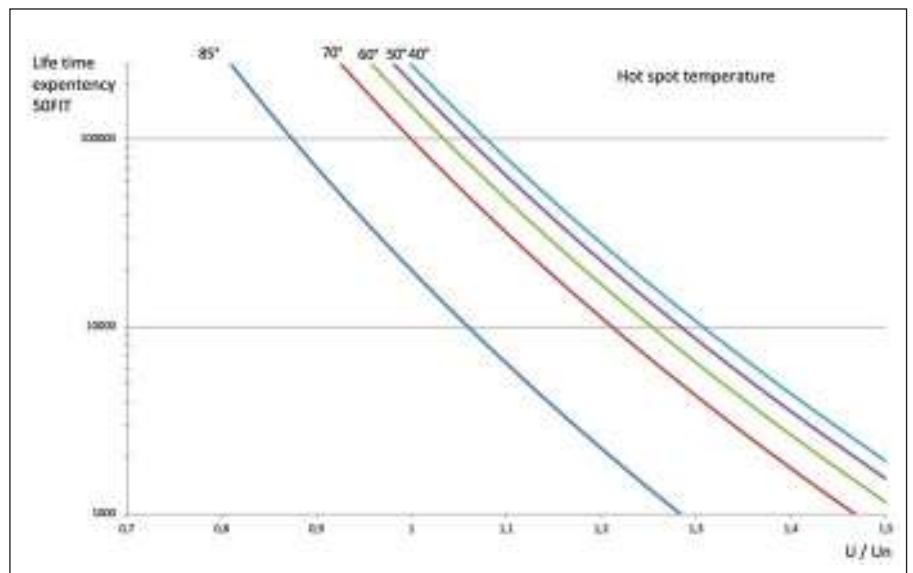
**LIFETIME**

The capacitor lifetime depends on the Hotspot temperature caused by current and applied voltage. Usually the service life is between 100 000 - 200 000 hours (see below graphic).

The lifetime described in this graph is calculated according to previous experiences and theoretical preconditions.

It is necessary to consider it as a theoretical curve.

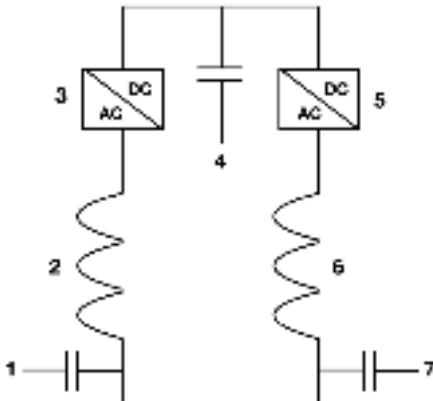
Lifetime can vary for different capacitor types and also for individual deliveries.



**PERMISSIBLE OVERTVOLTAGE:**

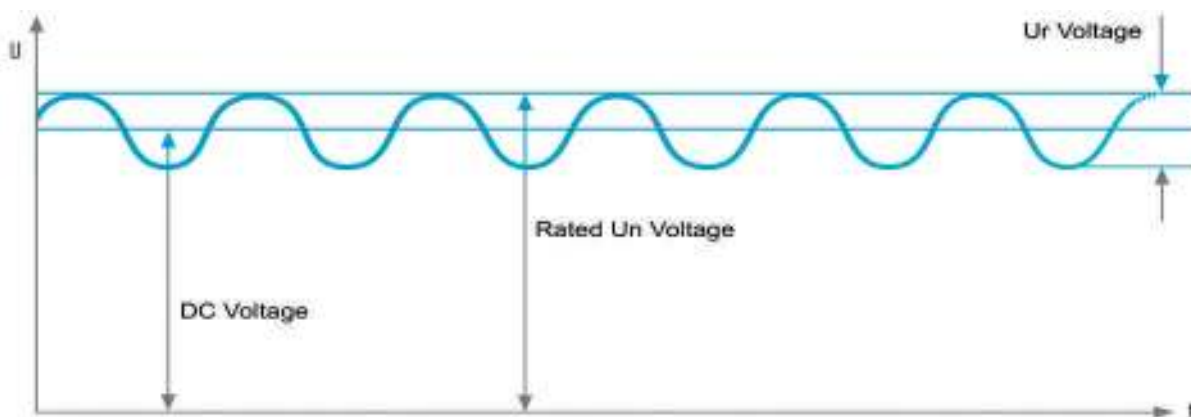
<b>1,1 x Un</b>	30% / day
<b>1,15 x Un</b>	30 min / day
<b>1,2 x Un</b>	5 min / day
<b>1,3 x Un</b>	1 min / day
<b>1,5 x Un</b>	100 ms / day

## ABBREVIATIONS



- 1,7 = AC Filter Capacitors
- 2 = Input Reactor
- 3,5 = Snubber Capacitors
- 4 = DC-LINK Capacitor
- 6 = Output reactor

- C<sub>N</sub>** = Capacitance value rated at 20 °C / 50 Hz.
- U<sub>N</sub>** = The maximum or peak voltage of any polarity of reversing or non reversing. type of wave (note that rated voltage is not rms value).
- U<sub>S</sub>** = Non repetitive peak (surge) voltage.
- U<sub>rms</sub>** = Max permissible value of sinusoidal AC voltage in continuous operation.
- U<sub>r</sub>** = The peak to peak alternating component of the unidirectional voltage.
- I<sub>MAX</sub>** = Maximum rms current value of permissible current in continuous operation.
- Î** = Maximum permitted repetitive current amplitude during continuous operation.
- I<sub>S</sub>** = Maximum current that may occur non-repetitively and briefly in the event of a fault. Maximum count 1000 times with a duration of not more that 50 ms each.
- R<sub>S</sub>** = Equivalent resistance representing the sum of Ohmic resistances occurring inside the capacitor.
- L<sub>e</sub>** = Self inductance representing the sum of all inductive elements which are contained in any capacitor.
- Tanδ** = Constant dissipation factor of the dielectric material for all capacitors in their rated frequency.
- R<sub>th</sub>** = Thermal resistance indicates by how many degrees the capacitor temperature at the hotspot rises in relation to the dissipation losses.
- Θ<sub>min</sub>** = Lowest permissible ambient temperature at which a capacitor may be used.
- Θ<sub>max</sub>** = Highest permissible capacitor temperature during operation, i.e. temperature at the hottest point of the case.
- Θ<sub>HOTSPOT</sub>** = Temperature at the hottest spot inside the capacitor.





## 3FCM 640 Vac to 1400 Vac Three Phase AC-Filter Capacitors

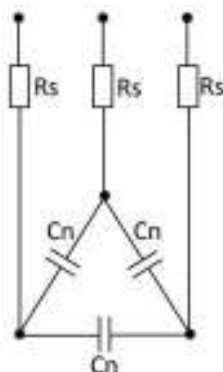
FCM capacitors are especially designed for harmonic filtering in three-phase. They stand out by their high AC voltage load capacity and suitability for high rms and surge currents. The three capacitor elements can be connected in delta or star configuration following the customer's requests. Very good self-healing characteristics and the integrated overpressure protection ensure safe operation and controlled disconnection in rare cases in which the capacitor could fail.

### TECHNICAL CHARACTERISTICS

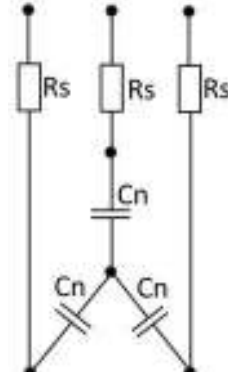
<b>Standards:</b>	IEC 61071, IEC 60831
<b>Origin:</b>	100% made in Italy
<b>Number of phase:</b>	3
<b>Voltage range*:</b>	640 Vac to 1400 Vac
<b>Capacitance tolerance*:</b>	±5%
<b>Insulation strength C x R<sub>IS</sub>:</b>	5000 s
<b>Tanδ:</b>	2 x 10 <sup>-4</sup>
<b>Filling material:</b>	polyurethane resin, Non-PCB
<b>Can:</b>	aluminium
<b>Mounting position:</b>	terminals pointing upwards
<b>Internal protection:</b>	self-healing and overpressure disconnecter
<b>Minimum operating temperature Θ<sub>min</sub>:</b>	- 40 °C
<b>Maximum operating temperature Θ<sub>max</sub>:</b>	+ 85 °C
<b>Temperature hotspot Θ<sub>HOTSPOT</sub>:</b>	≤ 85 °C
<b>Storing temperature:</b>	- 40 ... 85 °C
<b>Service life @ Θ<sub>HOTSPOT</sub> ≤ 70 °C:</b>	100000 h
<b>Voltage test between terminals Vdc:</b>	2,15 Un for 10 s
<b>Voltage test between terminals and case Vac:</b>	4800 Vac for 2 s
<b>Fastening and Earting:</b>	through 1 point, screw M8 or M12
<b>Discharge resistor:</b>	available on request

### PRINCIPAL CIRCUIT DIAGRAM

Delta Connection



Star Connection



\* Other values available on request.

Order code:	Cn 3 x $\mu$ F	Un Vac	Urms Vac	Us V	Rs m $\Omega$	Le nH	Rth K/W	I <sub>max</sub> A	I kA	Is kA	$\phi$ x H*	Terminal	PCS/BOX
3FCM14K450T153L7	14,0	640	450	1380	2	110	7,6	16	0,3	1,9	50 x 153	Fast-on 6,3	49
3FCM16K450T153M7	16,0	640	450	1380	2	100	7,6	16	0,4	1,9	55 x 153	Fast-on 6,3	49
3FCM17K450T153M7	17,0	640	450	1380	2	100	7,6	16	0,4	1,9	55 x 153	Fast-on 6,3	49
3FCM24K450T153N1	24,0	640	450	1380	2	110	6,3	16	0,6	2,0	60 x 153	Fast-on 6,3	36
3FCM33E450T185X1	33,0	640	450	1380	1	90	4,7	56	0,9	2,7	85 x 185	MT 25	9
3FCM40E450T185X1	40,0	640	450	1380	1	130	4,7	56	1,1	3,3	85 x 185	MT 25	9
3FCM46E450T185X1	46,0	640	450	1380	1	110	4,1	56	1,2	3,9	85 x 185	MT 25	9
3FCM51E450T185X1	51,0	640	450	1380	1	140	4,1	56	1,4	4,2	85 x 185	MT 25	9
3FCM57E450T225X1	57,0	640	450	1380	1	120	3,7	56	1,6	4,8	85 x 225	MT 25	9
3FCM68E450T185U1	68,0	640	450	1380	1	100	3,7	56	2,0	6,0	100 x 185	MT 25	5
3FCM100E450T225U1	100,0	640	450	1380	0	100	3,0	56	3,0	9,0	100 x 225	MT 25	5
3FCM200F450T225Z1	200,0	640	450	1380	1	125	1,8	80	3,5	10,5	136 x 225	MT 35	4
3FCM9K530A153L7	9,0	750	530	1610	1,8	100	7,6	16	0,3	1,0	50 x 153	Fast-on 6,3	49
3FCM12K530A153M7	12,0	750	530	1610	1,7	100	6,7	16	0,4	1,1	55 x 153	Fast-on 6,3	49
3FCM16K530A153N1	16,0	750	530	1610	1,6	100	6,3	16	0,6	1,8	60 x 153	Fast-on 6,3	36
3FCM23E530A185X1	23,0	750	530	1610	1,2	100	4,7	56	0,9	2,6	85 x 185	MT 25	9
3FCM29E530A185X1	29,0	750	530	1610	1,2	130	4,1	56	1,1	3,3	85 x 185	MT 25	9
3FCM30E530A185X1	30,0	750	530	1610	1,2	120	4,1	56	1,1	3,3	85 x 185	MT 25	9
3FCM47,9E530A225U1	47,9	750	530	1610	0,8	145	3,5	56	1,8	5,4	100 x 225	MT 25	5
3FCM100F530A225Z1	100,0	750	530	1610	0,6	120	2,1	80	2,2	6,6	136 x 225	MT 35	4
3FCM6,7K600B153L7	6,7	850	600	1830	2,0	100	7,6	16	0,3	0,9	50 x 153	Fast-on 6,3	49
3FCM11K600B153N1	11,0	850	600	1830	1,8	100	6,9	16	0,5	1,4	60 x 153	Fast-on 6,3	36
3FCM14E600B185X1	14,0	850	600	1830	1,3	130	4,7	56	0,6	1,8	85 x 185	MT 25	9
3FCM25E600B185X1	25,0	850	600	1830	1,1	100	4,1	56	1,0	3,0	85 x 185	MT 25	9
3FCM37,5E600B225U1	37,5	850	600	1830	0,8	100	3,5	56	1,5	4,5	100 x 225	MT 25	5
3FCM50E600B225U1	50,0	850	600	1830	0,4	100	3,0	56	2,0	6,0	100 x 225	MT 25	5
3FCM86E600B225Z1	86,0	850	600	1830	0,5	100	2,1	56	2,8	8,4	136 x 225	MT 25	4
3FCM4,7K760K153L7	4,7	1080	760	2320	1,8	100	7,6	16	0,5	1,5	50 x 153	Fast-on 6,3	49
3FCM5K760K153M7	5,0	1080	760	2320	1,6	100	6,9	16	0,6	1,7	55 x 153	Fast-on 6,3	49
3FCM7,3K760K153N1	7,3	1080	760	2320	1,5	100	6,3	16	0,8	2,4	60 x 153	Fast-on 6,3	36
3FCM9,7E760K185X1	9,7	1080	760	2320	1,2	120	4,7	56	1,1	3,3	85 x 185	MT 25	9
3FCM11E760K185X1	11,0	1080	760	2320	0,9	120	4,7	56	1,2	3,6	85 x 185	MT 25	9
3FCM16,7E760K185X1	16,7	1080	760	2320	0,7	130	3,7	56	1,9	5,7	85 x 185	MT 25	9
3FCM18,4E760K225X1	18,4	1080	760	2320	0,6	110	3,7	56	2,0	6,0	85 x 225	MT 25	9
3FCM22E760K225X1	22,0	1080	760	2320	0,6	120	3,5	56	2,5	7,5	85 x 225	MT 25	9
3FCM27,6E760K225U1	27,6	1080	760	2320	0,4	120	3,0	56	3,1	9,3	100 x 225	MT 25	5
3FCM33,4E760K225U1	33,4	1080	760	2320	0,4	120	3,0	56	3,6	10,8	100 x 225	MT 25	5
3FCM55,7E760K225Z1	55,7	1080	760	2320	0,4	130	2,1	56	5,0	15,0	136 x 225	MT 25	4
3FCM8E850I185X1	8,0	1200	850	2580	1,3	120	4,9	43	0,5	2,0	85 x 185	MT 25	9
3FCM12E850I185X1	12,0	1200	850	2580	1,1	120	4,3	43	0,6	2,1	85 x 185	MT 25	9
3FCM25E850I225U1	25,0	1200	850	2580	0,4	130	3,2	43	0,6	2,2	100 x 225	MT 25	5
3FCM55,7E850I300Y1	55,7	1200	850	2580	0,45	130	1,8	43	0,8	2,3	116 x 300	MT 25	5
3FCM33C1000M300Z1	33	1400	1000	3010	0,55	120	1,8	43	1	2,5	136 x 300	Screw M10	4



**420 Vac .... 1700 Vac\* / 700 Vdc .... 2800 Vdc\***  
**One Phase AC/DC Capacitors for General Use**

GCM capacitors are largely used in power electronics applications, as commutation, supporting, smoothing and surge discharge capacitors. They can be also used in AC filters, thanks to their AC voltage load capacity and outstanding suitability for high rms and surge currents. GCM capacitors are filled with liquid resin and have a high specific ration of capacitance to volume. Very good self-healing characteristics and the integrated overpressure protection ensure safe operation and controlled disconnection, in the rare cases in which the capacitor could fail.

**TECHNICAL CHARACTERISTICS**

<b>Standards:</b>	IEC 61071, IEC 60831
<b>Origin:</b>	100% made in Italy
<b>Number of phase:</b>	1
<b>Voltage range*:</b>	420 Vac .... 1700 Vac / 700 Vdc .... 280 Vdc
<b>Capacitance tolerance*:</b>	±10%
<b>Insulation strength C x R<sub>IS</sub>:</b>	5000 s
<b>Tanδ:</b>	2 x 10 <sup>-4</sup>
<b>Filling material:</b>	polyurethane resin, Non-PCB
<b>Can:</b>	aluminium
<b>Mounting position:</b>	terminals pointing upwards
<b>Internal protection:</b>	self-healing and overpressure disconnecter
<b>Minimum operating temperature Θ<sub>min</sub>:</b>	- 40 °C
<b>Maximum operating temperature Θ<sub>max</sub>:</b>	+ 85 °C
<b>Temperature hotspot Θ<sub>HOTSPOT</sub>:</b>	≤ 85 °C
<b>Storing temperature:</b>	- 40 ... 85 °C
<b>Service life @ Θ<sub>HOTSPOT</sub> ≤ 70 °C:</b>	100000 h
<b>Voltage test between terminals Vdc:</b>	2,15 Un for 10 s
<b>Voltage test between terminals and case Vac:</b>	4800 Vac for 2 s
<b>Fastening and Earthing:</b>	through 1 point, screw M8 or M12
<b>Discharge resistor:</b>	available on request

\* Other values available on request.



Order code:	Cn μF	Un Vdc	Urms Vac	Un Vac	Us V	Rs mΩ	Le nH	Rth K/W	I <sub>max</sub> A	I kA	Is kA	ø x H*	Terminal	PCS/BOX
GCM20D300H78B3	20,0	700	300	420	1050	2,5	60	19	16	0,50	1,50	35 x 78	Fast-on 6,3	49
GCM22D300H78B3	22,0	700	300	420	1050	4,8	80	16	10	0,30	0,90	35 x 78	Fast-on 6,3	49
GCM24D300H78E3	24,0	700	300	420	1050	4,4	80	16	10	0,30	0,90	40 x 78	Fast-on 6,3	49
GCM35D300H103E3	35,0	700	300	420	1050	4,4	80	17,3	16	0,40	1,20	40 x 103	Fast-on 6,3	49
GCM50D300H103E3	50,0	700	300	420	1050	4,4	80	15,4	16	0,60	1,70	40 x 103	Fast-on 6,3	49
GCM60C300H120R1	60,0	700	300	420	1050	2,8	100	13,9	32	0,70	2,10	70 x 120	Screw M10	16
GCM75D300H103N1	75,0	700	300	420	1050	2,6	80	12,6	16	0,75	2,60	60 x 103	Fast-on 6,3	36
GCM80D300H103N1	80,0	700	300	420	1050	2,5	80	12,6	16	0,90	2,70	60 x 103	Fast-on 6,3	36
GCM90D300H103N1	90,0	700	300	420	1050	2,4	80	11,5	16	1,00	3,00	60 x 103	Fast-on 6,3	36
GCM100C300H120R1	100,0	700	300	420	1050	2,2	100	10,1	40	1,20	3,50	70 x 120	Screw M10	16
GCM120C300H120R1	120,0	700	300	420	1050	1,2	140	7,5	50	1,40	4,20	70 x 120	Screw M10	16
GCM130C300H120R1	130,0	700	300	420	1050	0,9	110	6,3	40	1,20	3,60	70 x 120	Screw M10	16
GCM150C300H120R1	150,0	700	300	420	1050	1,9	80	8,5	43	1,70	5,10	70 x 120	Screw M10	16
GCM170E300H130X1	170,0	700	300	420	1050	0,9	140	6,6	50	2,00	6,00	85 x 130	MT 16	9
GCM180E300H130X1	180,0	700	300	420	1050	1,6	110	6,6	43	2,00	6,00	85 x 130	MT 16	9
GCM200C300H120X1	200,0	700	300	420	1050	3,6	140	4,7	30	1,20	3,60	85 x 120	Screw M10	9
GCM220E300H130X1	220,0	700	300	420	1050	0,8	140	5,9	50	2,50	6,00	85 x 130	MT 16	9
GCM220D300H153C1	220,0	700	300	420	1050	4,0	130	4,3	16	1,20	3,60	65 x 153	Fast-on 6,3	20
GCM300E300H185X1	300,0	700	300	420	1050	3,6	90	3,7	43	1,60	4,80	85 x 185	MT 16	9
GCM400C300H215X1	400,0	700	300	420	1050	0,6	160	2,1	80	4,50	13,50	85 x 215	Screw M10	9
GCM470E300H225X1	470,0	700	300	420	1050	0,6	160	3,5	50	5,30	13,70	85 x 225	MT 16	9
GCM500F300H225U1	500,0	700	300	420	1050	0,6	160	3,3	80	5,70	14,00	100 x 225	MT 25	5
GCM700F300H225Y1	700,0	700	300	420	1050	0,7	130	2,9	80	8,00	14,10	116 x 225	MT 25	5
GCM1100G300H225Z1	1100,0	700	300	420	1050	0,5	130	2,1	100	8,20	14,20	136 x 225	MT 35	4
GCM1500G300H300Z1	1500,0	700	300	420	1050	0,5	130	1,8	100	8,20	14,30	136 x 300	MT 35	4
GCM2000G300H300Z1	2000,0	700	300	420	1050	0,5	190	1,4	100	8,20	14,40	136 x 300	MT 35	4
GCM4,7D450J64A3	4,7	1000	450	640	1500	5,1	60	26,0	10	0,24	0,72	30 x 64	Fast-on 6,3	49
GCM5D450J64A3	5,0	1000	450	640	1500	4,9	60	26,0	10	0,26	0,80	30 x 64	Fast-on 6,3	49
GCM6D450J78A3	6,0	1000	450	640	1500	4,2	60	22,0	16	0,35	1,00	30 x 78	Fast-on 6,3	49
GCM6,8D450J78A3	6,8	1000	450	640	1500	4,0	60	22,0	16	0,35	1,00	30 x 78	Fast-on 6,3	49
GCM10D450J78B3	10,0	1000	450	640	1500	3,1	60	19,0	16	0,40	1,20	35 x 78	Fast-on 6,3	49
GCM15D450J103E3	15,0	1000	450	640	1500	5,0	80	14,0	16	0,24	0,70	40 x 103	Fast-on 6,3	49
GCM18D450J103E3	18,0	1000	450	640	1500	5,6	80	14,0	16	0,29	0,90	40 x 103	Fast-on 6,3	49
GCM22D450J103E3	22,0	1000	450	640	1500	3,9	80	12,0	16	0,35	1,10	40 x 103	Fast-on 6,3	49
GCM25D450J128K3	25,0	1000	450	640	1500	3,6	80	12,0	16	0,40	1,20	45 x 128	Fast-on 6,3	49
GCM30C450J120R1	30,0	1000	450	640	1500	3,5	100	10,0	33	0,50	0,40	70 x 120	Screw M10	16
GCM40D450J103N1	40,0	1000	450	640	1500	4,2	80	10,0	16	0,60	1,90	60 x 103	Fast-on 6,3	36
GCM47D450J103N1	47,0	1000	450	640	1500	3,9	80	8,7	16	0,80	2,30	60 x 103	Fast-on 6,3	36
GCM50C450J120R1	50,0	1000	450	640	1500	2,6	100	7,2	40	0,80	0,40	70 x 120	Screw M10	16
GCM68C450J120R1	68,0	1000	450	640	1500	3,7	100	6,6	30	0,90	2,70	70 x 120	Screw M10	16
GCM75C450J120X1	75,0	1000	450	640	1500	2,7	110	5,7	43	1,20	3,60	85 x 120	Screw M10	9
GCM80C450J120X1	80,0	1000	450	640	1500	1,9	110	5,0	43	1,30	3,80	85 x 120	Screw M10	9
GCM100C450J175X1	100,0	1000	450	640	1500	0,6	100	4,4	80	3,00	9,00	85 x 175	Screw M10	9
GCM120E450J185X1	120,0	1000	450	640	1500	1,6	110	4,5	43	1,90	5,80	85 x 185	MT 16	9
GCM120D450J153C1	120,0	1000	450	640	1500	4,5	130	4,3	16	0,90	2,70	65 x 153	Fast-on 6,3	20
GCM150C450J175X1	150,0	1000	450	640	1500	4,1	110	3,7	16	1,10	3,30	85 x 175	Screw M10	9
GCM200F450J225U1	200,0	1000	450	640	1500	0,8	160	2,7	80	3,50	4,00	100 x 225	MT 25	5
GCM250F450J225U1	250,0	1000	450	640	1500	0,7	130	2,5	80	4,00	5,40	100 x 225	MT 25	5
GCM250F450J225U1	250,0	1000	450	640	1500	1,9	130	2,7	43	4,00	5,50	100 x 225	MT 25	5
GCM350F450J225Y1	350,0	1000	450	640	1500	0,6	160	2,2	80	5,60	7,00	116 x 225	MT 25	5
GCM500G450J225Z1	500,0	1000	450	640	1500	0,6	170	1,6	100	5,80	7,30	136 x 225	MT 35	4
GCM750G450J300Z1	750,0	1000	450	640	1500	0,7	340	1,2	100	5,90	7,40	136 x 300	MT 35	4
GCM800G450J300Z1	800,0	1000	450	640	1500	0,6	170	1,3	100	6,00	7,90	136 x 300	MT 35	4
GCM1000G450J375Z1	1000,0	1000	450	640	1500	0,6	190	1,0	100	6,10	8,00	136 x 375	MT 35	2

Order code:	Cn µF	Un Vdc	Urms Vac	Un Vac	Us V	Rs mΩ	Le nH	Rth K/W	I <sub>max</sub> A	I kA	Is kA	ø x H*	Terminal	PCS/BOX
GCM3,3D480I64A3	3,3	1120	480	680	1680	6,1	60	25,6	15	0,17	0,5	30 x 64	Fast-on 6,3	49
GCM12D480I78E3	12,0	1120	480	680	1680	6,8	80	17,3	16	0,2	0,7	40 x 78	Fast-on 6,3	49
GCM20D480I128K3	20,0	1120	480	680	1680	5,5	80	15,4	16	0,4	1,1	45 x 128	Fast-on 6,3	49
GCM25C480I120R1	25,0	1120	480	680	1680	3,6	100	13,9	28	0,5	1,4	70 x 120	Screw M10	16
GCM30D480I128K3	30,0	1120	480	680	1680	4,5	80	12,6	16	0,5	1,6	45 x 128	Fast-on 6,3	49
GCM33D480I128K3	33,0	1120	480	680	1680	4,3	80	11,5	16	0,6	1,8	45 x 128	Fast-on 6,3	49
GCM40C480I120R1	40,0	1120	480	680	1680	2,8	100	10,1	38	0,7	2,2	70 x 120	Screw M10	16
GCM40C480I120R1	40,0	1120	480	680	1680	5,0	120	7,2	25	0,4	1,3	70 x 120	Screw M10	16
GCM60C480I175R1	60,0	1120	480	680	1680	2,8	110	7,5	43	1,1	3,3	70 x 175	Screw M10	16
GCM68C480I175R1	68,0	1120	480	680	1680	1,9	110	6,6	43	1,2	3,7	70 x 175	Screw M10	16
GCM90D480I153C1	90,0	1120	480	680	1680	4,8	110	4,3	16	0,8	2,4	65 x 153	Fast-on 6,3	20
GCM100D480I153C1	100,0	1120	480	680	1680	4,5	100	3,7	16	0,8	2,6	65 x 153	Fast-on 6,3	20
GCM100C480I175X1	100,0	1120	480	680	1680	1,6	110	5,6	43	1,8	5,5	85 x 175	Screw M10	9
GCM180C480I215X1	180,0	1120	480	680	1680	1,9	130	3,5	43	3,3	8,7	85 x 215	Screw M10	9
GCM200F480I225U1	200,0	1120	480	680	1680	0,7	160	3,3	80	3,7	9,0	100 x 225	MT 25	5
GCM280F480I225Y1	280,0	1120	480	680	1680	0,6	160	2,9	80	5,1	9,8	116 x 225	MT 25	5
GCM400G480I225Z1	400,0	1120	480	680	1680	0,6	170	2,1	100	7,3	10,0	136 x 225	MT 35	4
GCM600G480I300Z1	600,0	1120	480	680	1680	0,6	170	1,8	100	8,1	10,2	136 x 300	MT 35	4
GCM800G480I300Z1	800,0	1120	480	680	1680	0,6	190	1,4	100	8,3	10,4	136 x 300	MT 35	4
GCM4,7D530L78A3	4,7	1260	530	750	1900	10,0	60	18,3	10	0,2	0,7	30 x 78	Fast-on 6,3	49
GCM10D530L78E3	10,0	1260	530	750	1900	6,0	110	13,8	16	0,4	1,2	40 x 78	Fast-on 6,3	49
GCM20D530L128K3	20,0	1260	530	750	1900	3,9	100	13,9	16	0,4	1,2	45 x 128	Fast-on 6,3	49
GCM22D530L128K3	22,0	1260	530	750	1900	5,0	120	8,7	16	0,5	1,5	45 x 128	Fast-on 6,3	49
GCM24D530L128K3	24,0	1260	530	750	1900	6,0	110	12,6	16	0,5	1,5	45 x 128	Fast-on 6,3	49
GCM26D530L128K3	26,0	1260	530	750	1900	3,1	120	8,7	18	0,5	1,5	45 x 128	Fast-on 6,3	49
GCM29D530L103N1	29,0	1260	530	750	1900	3,0	120	8,7	16	0,6	1,8	60 x 103	Fast-on 6,3	36
GCM33C530L120R1	33,0	1260	530	750	1900	2,9	100	10	37	0,7	2,0	70 x 120	Screw M10	16
GCM47C530L175R1	47,0	1260	530	750	1900	3,0	110	7,5	43	1,0	2,9	70 x 175	Screw M10	16
GCM60C530L175R1	60,0	1260	530	750	1900	1,9	110	6,6	43	1,2	3,7	70 x 175	Screw M10	16
GCM70D530L153C1	70,0	1260	530	750	1900	5,1	140	4,3	16	0,6	2,0	65 x 153	Fast-on 6,3	20
GCM75C530L175R1	75,0	1260	530	750	1900	1,7	110	5,9	43	1,5	4,6	70 x 175	Screw M10	9
GCM80D530L153C1	80,0	1260	530	750	1900	4,8	130	3,7	16	0,7	2,3	65 x 153	Fast-on 6,3	20
GCM80C530L175X1	80,0	1260	530	750	1900	1,4	110	4,2	43	1,6	4,0	85 x 175	Screw M10	9
GCM150C530L215I1	150,0	1260	530	750	1900	2,0	130	3,5	43	3,1	4,5	95 x 215	Screw M10	9
GCM150F530L225U1	150,0	1260	530	750	1900	0,7	190	2,5	80	3,1	6,0	100 x 225	MT 25	5
GCM220F530L225Y1	220,0	1260	530	750	1900	0,7	160	2,9	80	4,5	5,6	116 x 225	MT 25	5
GCM330G530L225Z1	330,0	1260	530	750	1900	0,6	170	2,1	100	6,8	7,0	136 x 225	MT 35	4
GCM500G530L300Z1	500,0	1260	530	750	1900	0,6	170	1,8	100	7,0	7,4	136 x 300	MT 35	4
GCM600G530L300Z1	600,0	1260	530	750	1900	0,6	190	1,4	100	7,2	7,9	136 x 300	MT 35	4
GCM2D600AO64A3	2,0	1400	600	850	2100	7,6	60	26,0	10	0,1	0,5	30 x 64	Fast-on 6,3	49
GCM2,2D600AO64A3	2,2	1400	600	850	2100	7,0	60	26,0	10	0,2	0,6	30 x 64	Fast-on 6,3	49
GCM4D600AO78B3	4,0	1400	600	850	2100	10,0	80	18,0	10	0,1	0,5	35 x 78	Fast-on 6,3	49
GCM12D600AO103E3	12,0	1400	600	850	2100	7,9	110	12,0	16	0,3	0,8	40 x 103	Fast-on 6,3	49
GCM15D600AO128K3	15,0	1400	600	850	2100	4,0	80	10,5	16	0,3	0,9	45 x 128	Fast-on 6,3	49
GCM16D600AO128K3	16,0	1400	600	850	2100	4,2	100	10,0	30	0,4	1,1	45 x 128	Fast-on 6,3	49
GCM25C600AO120R1	25,0	1400	600	850	2100	3,2	100	7,2	40	0,6	1,7	70 x 120	Screw M10	16
GCM30C600AO120R1	30,0	1400	600	850	2100	3,9	110	6,3	30	0,6	1,7	70 x 120	Screw M10	16
GCM33C600AO120R1	33,0	1400	600	850	2100	3,3	110	5,7	38	0,8	2,3	70 x 120	Screw M10	16
GCM47C600AO120X1	47,0	1400	600	850	2100	2,1	110	5,0	43	1,1	3,2	85 x 120	Screw M10	9
GCM55D600AO153C1	55,0	1400	600	850	2100	5,1	130	4,3	16	0,6	1,8	65 x 153	Fast-on 6,3	20
GCM60E600AO185X1	60,0	1400	600	850	2100	1,8	110	4,5	43	1,4	2,5	85 x 185	MT 16	9
GCM68C600AO175R1	68,0	1400	600	850	2100	4,6	100	3,7	30	0,7	2,2	70 x 175	Screw M10	16
GCM120F600AO225U1	120,0	1400	600	850	2100	0,8	160	2,7	80	2,7	3,0	100 x 225	MT 25	5



Order code:	Cn μF	Un Vdc	Urms Vac	Un Vac	Us V	Rs mΩ	Le nH	Rth K/W	I <sub>max</sub> A	İ kA	Is kA	ø x H*	Terminal	PCS/BOX
GCM130F600AO225U1	130,0	1400	600	850	2100	0,8	160	2,5	80	3,0	3,2	100 x 225	MT 25	5
GCM180F600AO225Y1	180,0	1400	600	850	2100	0,7	160	2,2	80	3,4	3,5	116 x 225	MT 25	5
GCM270G600AO225Z1	270,0	1400	600	850	2100	0,7	160	1,6	100	3,8	3,7	136 x 225	MT 35	4
GCM400G600AO300Z1	400,0	1400	600	850	2100	0,6	170	1,3	100	4,5	4,5	136 x 300	MT 35	4
GCM500G600AO300Z1	500,0	1400	600	850	2100	0,6	190	1,0	100	5,0	5,0	136 x 300	MT 35	4
GCM1,5D720M64A3	1,5	1680	720	1000	2500	5,3	60	26,0	10	0,3	0,9	30 x 64	Fast-on 6,3	49
GCM2D720M78A3	2,0	1680	720	1000	2500	7,7	60	18,0	10	0,2	0,8	30 x 78	Fast-on 6,3	49
GCM2,2D720M78B3	2,2	1680	720	1000	2500	4,6	60	22,0	16	0,2	0,8	35 x 78	Fast-on 6,3	49
GCM3D720M78B3	3,0	1680	720	1000	2500	6,9	80	18,0	10	0,3	1,0	35 x 78	Fast-on 6,3	49
GCM4D720M78E3	4,0	1680	720	1000	2500	5,6	80	16,0	10	0,4	1,2	40 x 78	Fast-on 6,3	49
GCM5D720M78E3	5,0	1680	720	1000	2500	4,8	80	14,0	16	0,6	1,8	40 x 78	Fast-on 6,3	49
GCM6,8D720M103K3	6,8	1680	720	1000	2500	3,9	80	12,0	16	0,8	2,4	45 x 103	Fast-on 6,3	49
GCM8D720M103K3	8,0	1680	720	1000	2500	4,4	110	12,0	16	0,5	1,4	45 x 103	Fast-on 6,3	49
GCM10C720M120R1	10,0	1680	720	1000	2500	3,8	100	10,0	32	0,6	1,7	70 x 120	Screw M10	16
GCM12D720M128K3	12,0	1680	720	1000	2500	5,9	110	1,0	16	0,7	2,1	45 x 128	Fast-on 6,3	49
GCM15D720M103N1	15,0	1680	720	1000	2500	5,5	110	8,7	16	0,9	2,6	60 x 103	Fast-on 6,3	36
GCM16C720M120R1	16,0	1680	720	1000	2500	3,6	110	7,2	40	0,9	2,9	70 x 120	Screw M10	16
GCM18C720M120R1	18,0	1680	720	1000	2500	2,7	100	7,2	40	1,0	3,1	70 x 120	Screw M10	16
GCM20C720M120R1	20,0	1680	720	1000	2500	5,5	120	5,9	25	0,5	1,5	70 x 120	Screw M10	16
GCM20C720M120R1	20,0	1680	720	1000	2500	1,7	140	5,7	50	1,2	3,5	70 x 120	Screw M10	9
GCM28C720M120X1	28,0	1680	720	1000	2500	1,3	140	5,0	50	1,6	4,9	85 x 120	Screw M10	9
GCM33C720M120X1	33,0	1680	720	1000	2500	1,1	140	4,5	50	1,9	5,7	85 x 120	Screw M10	9
GCM38C720M120X1	38,0	1680	720	1000	2500	4,1	140	4,3	20	1,0	3,0	85 x 120	Screw M10	9
GCM53C720M175X1	53,0	1680	720	1000	2500	3,7	130	3,7	20	1,4	4,2	85 x 175	Screw M10	9
GCM68F720M225X1	68,0	1680	720	1000	2500	0,8	160	2,7	80	3,9	4,8	85 x 225	MT 25	9
GCM80C720M215I1	80,0	1680	720	1000	2500	0,7	160	2,5	80	4,6	5,6	95 x 215	Screw M10	9
GCM120F720M225Y1	120,0	1680	720	1000	2500	0,6	160	2,2	80	5,0	6,1	116 x 225	MT 25	5
GCM180G720M225Z1	180,0	1680	720	1000	2500	0,6	170	1,6	100	5,3	6,3	136 x 225	MT 35	4
GCM220G720M225Z1	220,0	1680	720	1000	2500	0,7	180	1,2	100	5,5	6,4	136 x 225	MT 35	4
GCM250G720M300Z1	250,0	1680	720	1000	2500	0,6	170	1,3	100	5,7	6,5	136 x 300	MT 35	4
GCM330G720M300Z1	330,0	1680	720	1000	2500	0,6	190	1,0	100	6,0	6,7	136 x 300	MT 35	4
GCM0,5C850N120R1	0,5	2000	850	1200	3000	8,5	60	26,0	30	0,1	0,5	70 x 120	Screw M10	16
GCM1C850N120R1	1,0	2000	850	1200	3000	6,5	60	26,0	30	0,2	0,8	70 x 120	Screw M10	16
GCM2C850N120R1	2,0	2000	850	1200	3000	8,0	60	18,0	30	0,2	0,8	70 x 120	Screw M10	16
GCM2,2C850N120R1	2,2	2000	850	1200	3000	10,0	90	16,0	30	0,2	0,6	70 x 120	Screw M10	16
GCM3,3C850N120R1	3,3	2000	850	1200	3000	3,5	80	16,0	30	0,8	2,4	70 x 120	Screw M10	16
GCM6,8C850N120R1	6,8	2000	850	1200	3000	3,6	100	10,5	30	0,5	1,5	70 x 120	Screw M10	16
GCM10C850N120R1	10,0	2000	850	1200	3000	3,3	100	7,2	30	0,7	2,1	70 x 120	Screw M10	16
GCM15C850N120X1	15,0	2000	850	1200	3000	3,8	120	6,3	30	0,8	2,4	85 x 120	Screw M10	9
GCM20C850N120R1	20,0	2000	850	1200	3000	4,3	120	5,1	30	0,8	0,4	70 x 120	Screw M10	16
GCM30E850N185X1	30,0	2000	850	1200	3000	4,3	130	4,3	30	1,0	3,0	85 x 185	MT 16	9
GCM32C850N215R1	32,0	2000	850	1200	3000	0,8	140	4,2	50	2,0	3,2	70 x 215	Screw M10	16
GCM40C850N215X1	40,0	2000	850	1200	3000	0,8	160	3,0	80	2,7	3,5	85 x 215	Screw M10	9
GCM100F850N225Z1	100,0	2000	850	1200	3000	1,8	150	2,2	80	3,2	4,0	136 x 225	MT 25	4
GCM1,5C960K120R1	1,5	2250	960	1350	3300	9,4	80	18,3	30	0,2	0,7	70 x 120	Screw M10	16
GCM4C960K120R1	4,0	2250	960	1350	3300	4,8	130	10,5	30	0,3	0,9	70 x 120	Screw M10	16
GCM5C960K120R1	5,0	2250	960	1350	3300	4,1	100	13,9	30	0,4	1,2	70 x 120	Screw M10	16
GCM6,8C960K120R1	6,8	2250	960	1350	3300	3,5	110	12,6	30	0,5	1,6	70 x 120	Screw M10	16
GCM10C960K120R1	10,0	2250	960	1350	3300	2,3	140	7,5	30	0,8	2,3	70 x 120	Screw M10	16
GCM15C960K120X1	15,0	2250	960	1350	3300	1,1	120	5,0	30	1,1	3,3	85 x 120	Screw M10	9

Order code:	Cn $\mu$ F	Un Vdc	Urms Vac	Un Vac	Us V	Rs m $\Omega$	Le nH	Rth K/W	I <sub>max</sub> A	I <sub>r</sub> kA	I <sub>s</sub> kA	$\phi$ x H*	Terminal	PCS/BOX
GCM16C960K120X1	16,0	2250	960	1350	3300	1,2	140	6,6	30	1,2	3,7	85 x 120	Screw M10	9
GCM20C960K215R1	20,0	2250	960	1350	3300	1,3	140	5,9	30	1,5	4,6	70 x 215	Screw M10	16
GCM22C960K215X1	22,0	2250	960	1350	3300	1,1	160	3,4	80	1,9	5,7	85 x 215	Screw M10	9
GCM40E960K215I1	40,0	2250	960	1350	3300	0,9	160	3,5	80	3,0	8,0	95 x 215	MT 16	9
GCM47C960K225Y1	47,0	2250	960	1350	3300	0,8	160	3,3	80	3,4	8,3	116 x 225	Screw M10	5
GCM68C960K225Z1	68,0	2250	960	1350	3300	0,7	160	2,9	80	4,0	8,5	136 x 225	Screw M10	4
GCM100G960K225Z1	100,0	2250	960	1350	3300	0,7	170	2,1	100	4,3	8,9	136 x 225	MT 35	4
GCM150G960K300Z1	150,0	2250	960	1350	3300	0,6	170	1,8	100	4,5	9,3	136 x 300	MT 35	4
GCM180G960K375Z1	180,0	2250	960	1350	3300	0,6	190	1,4	100	4,7	9,5	136 x 375	MT 35	2
GCM0,33C1200P120R1	0,3	2800	1200	1700	4200	9,0	60	26,0	30	0,2	0,6	70 x 120	Screw M10	16
GCM0,47C1200P120R1	0,5	2800	1200	1700	4200	9,0	60	26,0	30	0,2	0,6	70 x 120	Screw M10	16
GCM1C1200P120R1	1,0	2800	1200	1700	4200	11,0	80	18,0	30	0,2	0,6	70 x 120	Screw M10	16
GCM1C1200P120R1	1,0	2800	1200	1700	4200	5,5	150	16,0	30	0,4	1,2	70 x 120	Screw M10	16
GCM2,2C1200P120R1	2,2	2800	1200	1700	4200	7,0	80	12,0	30	0,2	0,6	70 x 120	Screw M10	16
GCM2,5C1200P120R1	2,5	2800	1200	1700	4200	10,2	120	15,0	30	0,2	0,7	70 x 120	Screw M10	16
GCM3,3C1200P120R1	3,3	2800	1200	1700	4200	8,8	120	14,0	30	0,3	1,0	70 x 120	Screw M10	16
GCM4C1200P120R1	4,0	2800	1200	1700	4200	3,0	140	6,0	30	0,8	1,5	70 x 120	Screw M10	16
GCM4,7C1200P120R1	4,7	2800	1200	1700	4200	7,4	120	13,0	30	0,5	1,4	70 x 120	Screw M10	16
GCM6,8C1200P120X1	6,8	2800	1200	1700	4200	2,6	140	7,5	30	0,7	2,0	85 x 120	Screw M10	9
GCM10C1200P215R1	10,0	2800	1200	1700	4200	1,9	140	6,6	30	1,0	2,6	70 x 215	Screw M10	16
GCM12C1200P215R1	12,0	2800	1200	1700	4200	1,6	140	5,9	30	1,2	3,2	70 x 215	Screw M10	16
GCM25C1200P215U1	25,0	2800	1200	1700	4200	1,0	160	3,5	80	2,4	5,0	100 x 215	Screw M10	5
GCM30C1200P215Y1	30,0	2800	1200	1700	4200	0,9	160	33,0	80	2,9	5,1	116 x 215	Screw M10	5
GCM40C1200P215Z1	40,0	2800	1200	1700	4200	0,8	160	2,9	80	3,4	5,5	136 x 215	Screw M10	4
GCM50C1200P225Z1	50,0	2800	1200	1700	4200	1,5	150	2,2	80	2,3	5,6	136 x 225	Screw M10	4
GCM90C1200P375Z1	90,0	2800	1200	1700	4200	0,7	170	2,1	80	3,7	5,9	136 x 365	Screw M10	2
GCM110C1200P375Z1	110,0	2800	1200	1700	4200	0,6	170	1,8	80	4,4	6,2	136 x 365	Screw M10	2





## 450 Vdc .... 900 Vdc DC-LINK capacitors for Automotive sector (EV & HEV)

DCAM capacitors are designed for AC/DC power converters application especially for electric and hybrid vehicles. They are featured by high capacitance, small volume, withstands high ripple current, thermostability and high pressure resistance.

All these features make these capacitors perfect for the automotive sector. Their very good self-healing characteristics special profile and wave cut metallized film ensure low self-inductance and high reliability.

### TECHNICAL CHARACTERISTICS

<b>Standards:</b>	IEC 61071, IEC 61881
<b>Origin:</b>	100% made in Italy
<b>Voltage range*:</b>	450 Vdc to 900 Vdc
<b>Capacitance tolerance*:</b>	±10%
<b>Dielectric:</b>	special metallized PP film
<b>Tanδ:</b>	2 x 10 <sup>-4</sup>
<b>Filling material:</b>	dry, filling with epoxy self-extinguishing resin UL-94 V0 , non-inductive, Non-PCB
<b>Case:</b>	plastic
<b>Mounting position:</b>	any
<b>Internal protection:</b>	self-healing
<b>Minimum operating temperature <math>\Theta_{min}</math>:</b>	- 40 °C
<b>Maximum operating temperature <math>\Theta_{max}</math>:</b>	+105 °C
<b>Temperature hotspot <math>\Theta_{HOTSPOT}</math>:</b>	≤ 105 °C
<b>Storing temperature:</b>	- 40... 85 °C
<b>Operating humidity:</b>	≤ 95%
<b>Altitude:</b>	≤ 3000 m
<b>Service life @ <math>\Theta_{HOTSPOT} \leq 85</math> °C:</b>	50000 h at Un
<b>Voltage test between terminals Vdc:</b>	1,5 Un (DC) for 10 s
<b>Voltage test between terminals and case:</b>	3000 Vac for 10 s at 50/60 Hz
<b>Failure rate:</b>	< 100 FIT

Order code:	Cn μF	Un Vdc	Rs mΩ	Rth °C/W	I <sub>max</sub> 60 °C A	W mm	D mm	H mm
DCAM200K450T375	200	450	0,80	3,00	85	150	45	70
DCAM330K450T581	330	450	1,00	1,50	85	226	66	42
DCAM600K450T253	600	450	0,60	1,50	160	180	60	60
DCAM600K500T735	600	500	0,80	2,50	150	200	60	80
DCAM750K500T342	750	500	0,50	2,50	140	197	77	57
DCAM950K500T597	950	500	0,25	1,65	250	190	88	80
DCAM450K600T846	450	600	0,60	1,50	220	180	60	60
DCAM600K600T029	600	600	1,00	2,40	85	225	118	47
DCAM440K800T468	440	800	0,50	2,50	150	200	60	80
DCAM600K800T255	600	800	0,80	2,20	140	198	79	90
DCAM100K900T596	100	900	0,40	2,77	140	184	83	50

\* Other values available on request.



**600 Vdc .... 5000 Vdc**  
**Rectangular High Voltage DC-LINK capacitors**

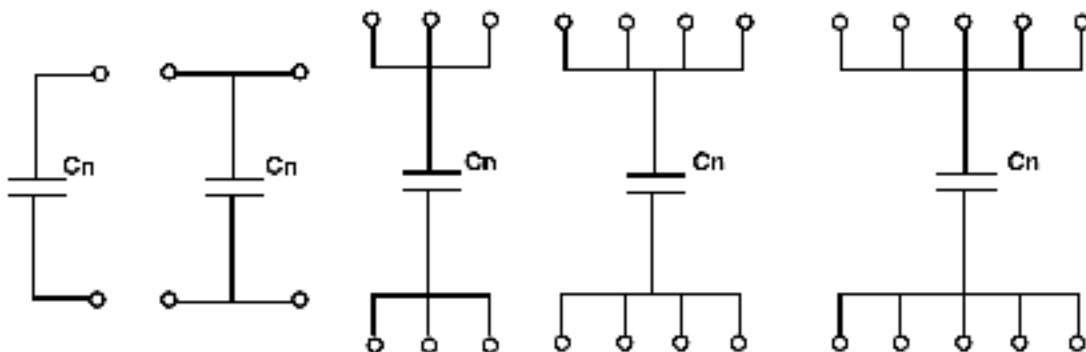
DCHM capacitors are especially designed for AC/DC application. They are featured by high voltage and high capacitance and, for this reason, are perfect for traction drivers, wind power converters and solar inverters. Their very good self-healing characteristics and specially profile and wave cut metallized film ensures low self-inductance high rupture resistance and high reliability.

### TECHNICAL CHARACTERISTICS

<b>Standards:</b>	IEC 61071, IEC 61881
<b>Origin:</b>	100% made in Italy
<b>Number of terminals:</b>	from 2 to 10
<b>Voltage range*:</b>	600 Vdc to 5000 Vdc
<b>Capacitance tolerance*:</b>	±10%
<b>Dielectric:</b>	Special metallized PP film
<b>Tanδ:</b>	$2 \times 10^{-4}$
<b>Insulation resistor (RC):</b>	≥20,000 s. (Un 25 °C)
<b>Filling material:</b>	Dry, filling with epoxy self-extinguishing resin UL-94 V0 , Non-PCB
<b>Case:</b>	304 stainless rectangular steel case
<b>Mounting position:</b>	terminals pointing upwards recommended
<b>Internal protection:</b>	self-healing and overpressure switch (on request)
<b>Minimum operating temperature <math>\Theta_{min}</math>:</b>	- 40 °C
<b>Maximum operating temperature <math>\Theta_{max}</math>:</b>	+ 85 °C
<b>Temperature hotspot <math>\Theta_{HOTSPOT}</math>:</b>	≤ 85 °C
<b>Storing temperature:</b>	- 40 ... 85 °C
<b>Altitude:</b>	≤ 2000 m
<b>Service life @ <math>\Theta_{HOTSPOT} \leq 70</math> °C:</b>	100000 h
<b>Voltage test between terminals Vdc:</b>	1,5 Un (DC) for 10 s
<b>Voltage test between terminals and case:</b>	$2 \times U_I + 1000$ Vac for 10 s
<b>Fastening and Earthing:</b>	through 1 point
<b>Discharge resistor:</b>	available on request

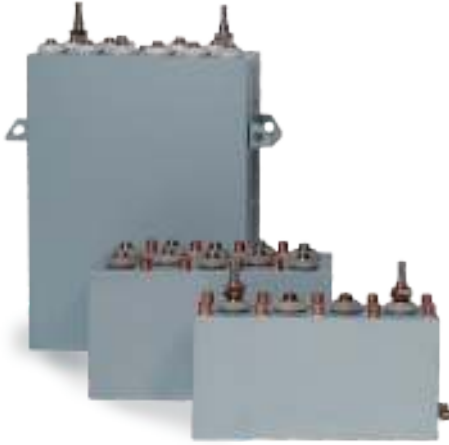
\* Other values available on request.

### PRINCIPAL CIRCUIT DIAGRAM



Order code:	Cn μF	Un Vdc	Rs mΩ	Rth °C/W	I <sub>max</sub> A	N° of terminals	W mm	D mm	H mm
DCHV2500S800G2X12	2500	800	0,25	0,67	200	2	200	130	220
DCHV60S1200G2X15	60	1200	0,40	2,10	90	2	180	125	80
DCHV4000S1200G8X31	4000	1200	1,00	0,23	350	8	350	125	260
DCHV420S1250G2X24	420	1250	0,60	1,00	250	2	200	130	85
DCHV500S1250G2X32	500	1250	0,60	1,00	200	2	175	155	95
DCHV320S2000G2X1	320	2000	3,00	1,18	65	2	250	130	130
DCHV750S2200G2X23	750	2200	0,40	3,20	100	2	250	75	455
DCHV1000S2200G2X43	1000	2200	0,36	2,90	130	2	250	90	455
DCHV1600S2200G4X45	1600	2200	0,32	2,70	200	4	250	175	455
DCHV2000S2200G2X65	2000	2200	0,29	2,10	220	2	250	200	455
DCHV2500S2200G6X23	2500	2200	0,20	0,42	340	6	370	300	300
DCHV4500S2200G6X15	4500	2200	0,12	0,42	550	6	370	300	380
DCHV6000S2200G4X64	6000	2200	0,12	0,65	540	4	530	230	450
DCHV6800S2200G8X25	6800	2200	0,20	0,12	900	8	350	340	570
DCHV8200S2200G10X4	8200	2200	0,35	0,17	700	10	580	503	255
DCHV10000S2200G8X2	10000	2200	0,08	0,17	700	8	588	270	570
DCHV2000S2800G4X98	2000	2800	0,70	0,50	150	4	400	170	520
DCHV9000S2800G8X65	9000	2800	0,10	0,23	700	8	635	175	1085
DCHV11000S3100G8X5	11000	3100	0,10	0,28	750	8	700	265	1060
DCHV2000S3300G4X97	2000	3300	0,39	0,25	265	4	710	230	340
DCHV1200S3500G2X76	1200	3500	0,25	0,67	350	2	340	180	460
DCHV2500S4400G4X78	2500	4400	0,40	2,40	100	4	590	275	765
DCHV500S4600G2X33	500	4600	0,70	0,75	200	2	360	150	450
DCHV120S6000G4X35	120	6000	1,50	3,50	50	4	250	175	450





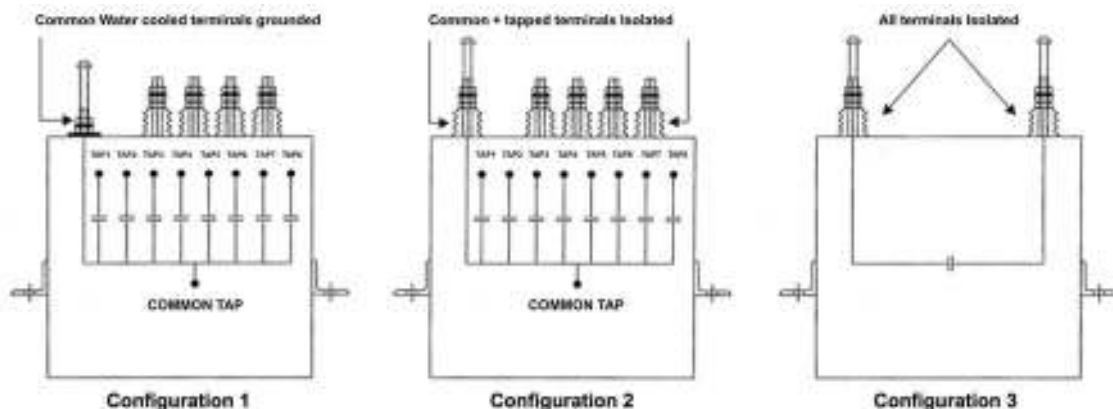
Medium & high frequency water-cooled / air-cooled capacitors are specially designed for use in inductive heating & melting plants for power factor improvement as also for tuning of the circuits for varying inductive loads. These capacitors are manufactured against order to meet the specific and exacting requirements of each customer. For the given application, the performance of these capacitors, demand extreme levels of Reliability, Safety and Life expectancy.

We supply Capacitors required as replacements in induction furnaces, with every effort to closely match dimensions of the failed units. Please contact us with a sketch of the failed capacitor, showing critical parameters such as terminal arrangements and case dimensions.

**TECHNICAL CHARACTERISTICS**

<b>Standards:</b>	IEC 60110
<b>Origin:</b>	100% made in Italy
<b>Voltage:</b>	up to 4000 Vac
<b>Power output:</b>	up to 8400 kVar
<b>Frequency:</b>	from 50 to 20000 Hz
<b>Rated current:</b>	not exceeding 4000 A
<b>Dielectric:</b>	electrical grade hazy BOPP film
<b>Electrode:</b>	aluminum foil
<b>Filling material:</b>	non-PCB, biodegradable, non-toxic electrical grade insulating oil
<b>Phase:</b>	single phase
<b>Terminals:</b>	all terminals water cooled or 2 water cooled terminals + taps
<b>Temperature category:</b>	up to 50 °C
<b>Overload limits:</b>	1,05 x Un for maximum 12 hours / day, 1,15 x In
<b>Terminal insulators:</b>	electrical grade molded bakelite
<b>Terminations:</b>	extruded brass, with non-magnetic connection hardware
<b>Cooling:</b>	water cooled by de-mineralized water minimum 5 L/min
<b>Cooling tubes:</b>	electrolytic grade copper tube
<b>Mounting: up wards</b>	horizontal with terminals side wards or vertical with terminals up wards
<b>Casing:</b>	aluminium or brass
<b>Case design:</b>	isolated (dead) or live case
<b>Protection:</b>	thermal and over pressure cut-off (optional)
<b>Voltage test between terminals:</b>	2 x Un AC for 10 s. or 4 x Un DC for 10 s.
<b>Voltage test between terminals and casing:</b>	2,15 x Un AC for 10 s., minimum voltage 2 kV

**CAPACITORS CONFIGURATION.**





High Energy Storage Capacitors are able to store extremely high energy in limited space without sacrificing reliability, quality and degree of accuracy of on board supply. Inside the capacitor we find special winding with minimum inductance and parallel bus bar connection system is used for external connection. Considering the high discharge current duty the inter element connections are designed to withstand the electromagnetic forces developed. These capacitors are charged at a relatively slow rate from few milliseconds to a couple of seconds and discharged at very fast rate. Therefore, very high power outputs are obtained. The percentage of reversal voltage becomes an important parameter in design of capacitor and his cost.

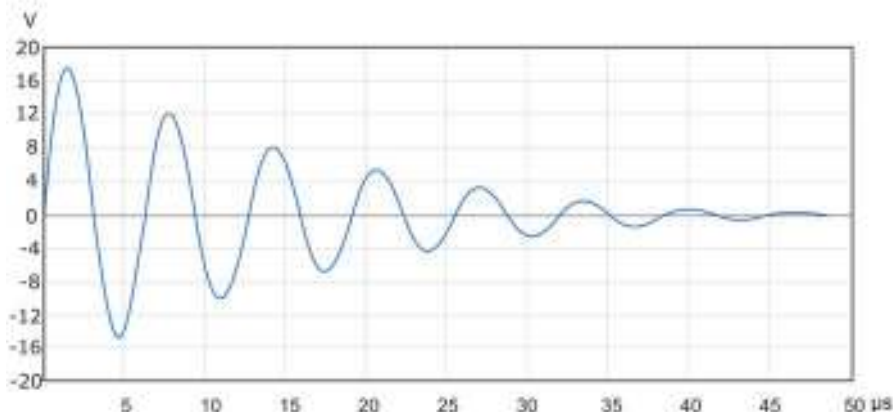
**Main features of HESC capacitors are:**

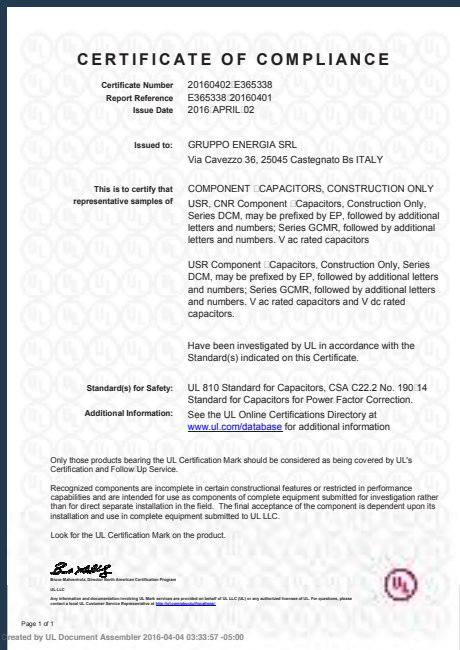
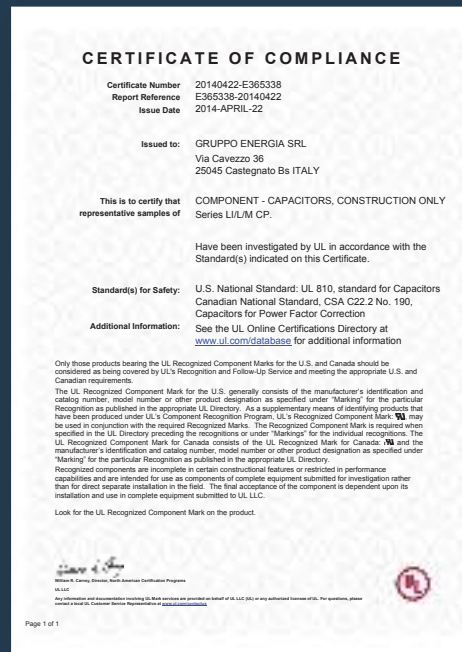
- **High Energy Density**
- **Very Low Inductance**
- **High Peak Discharge Current**
- **High Pulse Repetition Rate**
- **Life With High Reliability**

**TECHNICAL CHARACTERISTICS**

<b>Standards:</b>	IEC 61071
<b>Origin:</b>	100% made in Italy
<b>Voltage range:</b>	from 1,5 kV to 35 kV
<b>Energy range:</b>	from 1 kJ to 12,5 kJ
<b>Capacitance range:</b>	from 10 $\mu$ F to 250 $\mu$ F
<b>Inductance:</b>	less than 30 nH
<b>Peak current:</b>	up to 375 kA
<b>Max overload current:</b>	1,1 rated peak discharge current
<b>Operating temperature:</b>	from -40 to 55 °C
<b>Storage temperature:</b>	from -40 to 55 °C
<b>Life expectancy:</b>	10 5 shorts (other on request)
<b>Operation:</b>	capacitors are designed to operate at value of voltage reversals are 20% to 80%.
<b>Filling material:</b>	non-PCB, biodegradable, non-toxic special fluid
<b>Winding material:</b>	special PP metallized film or impregnated all film
<b>Terminals:</b>	discharge current up to 400 kA

**DISCHARGE WAVEFORM OF 1  $\mu$ F, 100 kV DC CAPACITORS.**





MADE IN ITALY



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