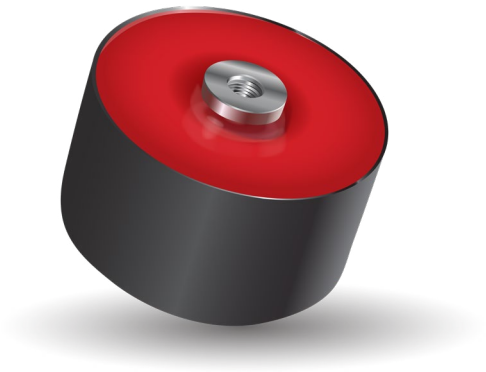
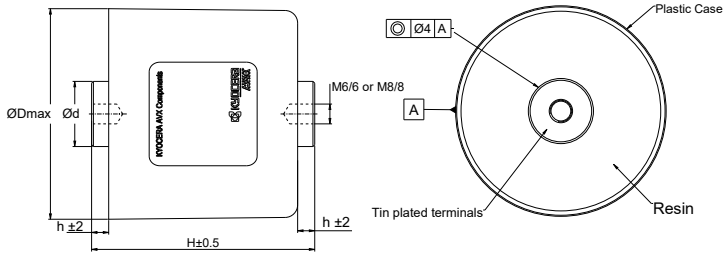
PROTECTION



PROTECTION

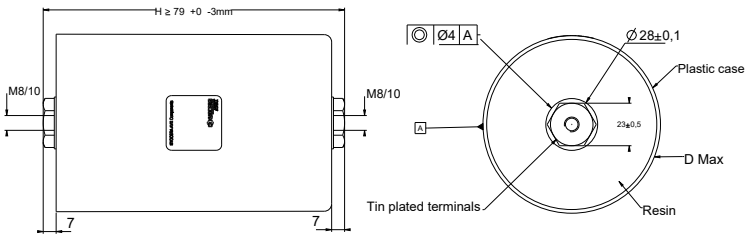
Plastic Case Style M6 / 6 or M8 / 8

Max Torque : 8.5Nm (M8)
4.5Nm (M6)



Plastic Case Style M8 / 10

Max Torque : 8.5Nm (M8)
The positions of the connection of each side are not indexed



APPLICATIONS

- Protection of Thyristors
- Protection of Gate Turn-off Thyristor (G.T.O.)
- Clamping (Secondary Snubber)

TECHNOLOGY

Metallized polypropylene dielectric capacitor with controlled self-healing.

Reinforced metallization developed for high impulse currents.

Axial connections specially developed to reduce series inductance and to provide rigid mechanical mounting.

STANDARDS

IEC 61071: Capacitors for power electronics
IEC 61881: Railway applications - Rolling stock equipment - Capacitors for power electronics
IEC 61373: Railway applications - Rolling stock equipment - Shock and vibration tests
IEC 60068-1: Environmental testing - Part 1: general and guidance
UL 94: Tests for Flammability of Plastic Materials for Parts in Devices and Appliances

PACKAGING MATERIAL

Cylindrical in plastic case filled with thermosetting resin.

Terminals: threaded inserts either M6 or M8.

The plastic case and the thermosetting resin are self-extinguishing materials. These two housing materials have the UL Recognition at V-0 level according to the UL 94 standard and have certified classifications according to the EN 45545-2 standard.

HOT SPOT CALCULATION

Total losses are calculated as follow: $P_t = P_j + P_d$

Joule losses: $P_j = R_s \times (I_{rms})^2$

Dielectric losses: $P_d = Q \times tg\delta_0$ with

- Q(reactive power) = $\frac{(I_{rms})^2}{C2\pi f}$ for a waveform of f frequency
- $tg\delta_0 = 2 \times 10^{-4}$ (dielectric losses of polypropylene)

Hot spot temperature will be:
$\theta_{HS} = \theta_{terminal} + (P_j + P_d) \times R_{th}$

Due to the design of the capacitor and its technology, the thermal impedance between the terminations and the core of the capacitor is low, it is necessary to take care that the capacitor is never overheated by use of incorrect sized connections.

WORKING TEMPERATURE

(according to the power to be dissipated) -40°C to +85°C

HOW TO ORDER

FPX	6	6	N	0154	J	––
Series	**Case Size**	**Dielectric**	**Voltage Code**	**Capacitance Code**	**Capacitance Tolerances**	**Terminal Code**
FPX = Standard FPY = RoHS Compliant	Case Size 6 Case Size 8 (See Case Style)	6 = Polypropylene	N = 2000V P = 2500V X = 3500V Z = 4500V Y = 4600V	0 + pF code 0105 = 1.0µF 0335 = 3.5µF 0504 = 0.5µF etc.	J = ± 5%	– – = Standard

Not RoHS Compliant

RoHS COMPLIANT

Please select correct termination style.

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ELECTRICAL CHARACTERISTICS

Capacitance range C_n	0.5µF to 6µF
Tolerance on C_n	±5%
Rated DC voltage $V_n$dc	1000 to 3000 V
Peak voltage V_{peak}	1600 to 4000 V
Allowable overvoltage V_s (for 10 s/day)	2000 to 4600 V
Stray inductance	5 to 20 nH
RMS current	I_{rms} max. = up to 160 A The currents shown in the tables are maximum. It is necessary to respect the thermal limits of the dielectric 85°C see “Hot spot temperature calculation”
Insulation resistance	Ri x C ≥ 30,000 s
Impulse current	I^2.t maxi. = up to 729 A^2.s Spikes or peak currents in the capacitors may cause a deterioration of the bonding between the metallization and the connections. These bonds are capable of withstanding only a limited amount of energy for each spike. The table shows the maximum energy permitted in the form (I^2.t), where I is in Ampere, and t is in seconds.
Note: The formula (I^2.t) replaces dV/dt which is less easy to use as it is not an expression of energy (I = C.dV/dt). This type of capacitor has been designed to withstand high (I^2.t) values.	
Variation of capacitance with temperature	$\frac{\Delta C}{C}$ ≤ ±2% between -40 and +85°C
Climatic category	40/085/56 (IEC 60068)
Test voltage between terminals @ 25°C	Vs for 10s
Test voltage between terminals and case @ 25°C (Type test)	@ 7 kV_{rms} @ 50 Hz for 1 min.
Dielectric	Polypropylene

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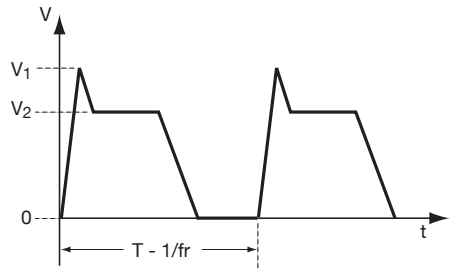
PROTECTION

Part Number	Cn (µF)	Dimensions					I²t max. (A²s)	I_{rms} max. (A)	R_s (mΩ)	Rth (°C/W)	Typical Weight (g)
		Case Style	H* ±0.5 (mm)	h ±2 (mm)	D max. (mm)	d ±0.5 (mm)					
FPX 2000V $V_n$dc = 1000V V_{peak} = 1600V V_{rms} = 560V V_s = 2000V (Voltage Code N)											
FPX66N0105J--	1	Plastic case M6/6	52	5	40	18	2	15	2.4	14	120
FPX86N0205J--	2	Plastic case M8/8	52	5	60	22	8	30	1.2	6.1	190
FPX86N0305J--	3	Plastic case M8/8	52	5	72	22	18	45	0.9	4.5	260
FPX86N0355J--	3.5	Plastic case M8/8	52	5	72	22	25	50	0.85	4.5	260
FPX86N0405J--	4	Plastic case M8/8	52	5	82	22	32	60	0.75	3.5	320
FPX86N0505J--	5	Plastic case M8/8	52	5	82	22	50	70	0.65	2.5	320
FPX 2500V $V_n$dc = 1300V V_{peak} = 2000V V_{rms} = 700V V_s = 2500V (Voltage Code P)											
FPX66P0504J--	0.5	Plastic case M6/6	52	5	40	18	1	15	3	14	120
FPX86P0105J--	1	Plastic case M8/8	52	5	60	22	3	20	2.3	10.5	190
FPX86P0155J--	1.5	Plastic case M8/8	52	5	60	22	7	30	1.5	6.1	190
FPX86P0205J--	2	Plastic case M8/8	52	5	72	22	12.7	40	1.1	4.5	260
FPX86P0255J--	2.5	Plastic case M8/8	52	5	72	22	20	60	0.89	3.7	260
FPX86P0305J--	3	Plastic case M8/8	52	5	82	22	28	60	0.85	3.2	320
FPX86P0355J--	3.5	Plastic case M8/8	52	5	82	22	39	65	0.78	2.9	320
FPX 3500V $V_n$dc = 2000V V_{peak} = 2400V V_{rms} = 850V V_s = 3500V (Voltage Code X)											
FPX86X0205J--	2	Plastic case M8/8	62	5	72	22	23	41	1.24	6.1	310
FPX86X0305J--	3	Plastic case M8/8	62	5	92	22	50	62	0.92	3.9	475
FPX86X0355J--	3.5	Plastic case M8/8	62	5	92	22	70	72	0.83	3.4	475
FPX86X0405J--	4	Plastic case M8/8	62	5	92	22	85	80	0.78	3.1	475
FPX 4500V $V_n$dc = 2500V V_{peak} = 3200V V_{rms} = 1130V V_s = 4500V (Voltage Code Z)											
FPX86Z0904J--	0.9	Plastic case M8/8	62	5	72	22	15	40	1.5	6.2	310
FPX86Z0105J--	1	Plastic case M8/8	62	5	72	22	15	38	1.4	6.2	310
FPX86Z0205J--	2	Plastic case M8/8	62	5	92	22	70	75	0.85	3.1	475
FPX 4600V $V_n$dc = 3000V V_{peak} = 4000V V_{rms} = 1400V V_s = 4600V (Voltage Code Y)											
FPX86Y0504J--	0.5	Plastic case M8/8	62	5	72	22	7	40	1.7	12	310
FPX86Y0684J--	0.68	Plastic case M8/8	62	5	72	22	14	35	1.59	6.2	310
FPX86Y1254J--	1.25	Plastic case M8/8	62	5	92	22	50	65	1	3.3	475
FPX86Y0155J--	1.5	Plastic case M8/10	79	6	98	–	32	60	1.4	8.3	630
FPX86Y0175J--	1.7	Plastic case M8/10	79	6	98	–	40	70	1.3	7.4	630
FPX86Y0205J--	2	Plastic case M8/10	79	6	98	–	56	80	1.1	6.3	630
FPX86Y0255J--	2.5	Plastic case M8/10	118	6	98	–	200	130	0.8	1.1	1020
FPX86Y0275J--	2.7	Plastic case M8/10	118	6	98	–	232	140	0.7	1.1	1020
FPX86Y0305J--	3	Plastic case M8/10	143	6	98	–	128	100	0.9	1.5	1280
FPX86Y0355J--	3.5	Plastic case M8/10	143	6	98	–	170	110	0.8	1.4	1280
FPX86Y0405J--	4	Plastic case M8/10	143	6	98	–	224	115	0.8	1.4	1280
FPX86Y0455J--	4.5	Plastic case M8/10	163	6	98	–	522	120	0.6	1.7	1500
FPX86Y0505J--	5	Plastic case M8/10	163	6	98	–	600	130	0.6	1.7	1500
FPX86Y0605J--	6	Plastic case M8/10	163	6	98	–	729	160	0.5	1.7	1500

* Tol: +0 / -3mm for H ≥ 118mm

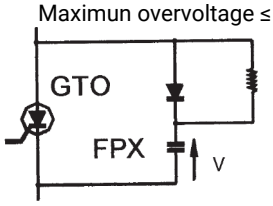
PROTECTION

G.T.O.



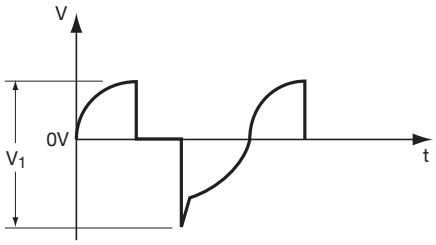
Choice of voltage: $V_1 \leq V_{peak}$
$V_2 \leq V_n dc$

Maximun overvoltage ≤ V_s (10s/day)



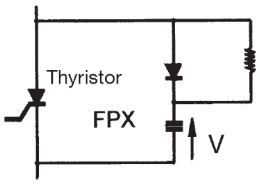
Nominal DC voltage ($V_n dc$) and peak voltage (V_{peak}) are given in the tables.

THYRISTOR



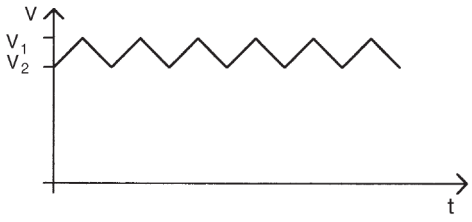
Choice of voltage: $V_1 \leq V_{peak}$

Note that V_1 is the voltage peak to peak and cannot be symmetrical vs 0 V

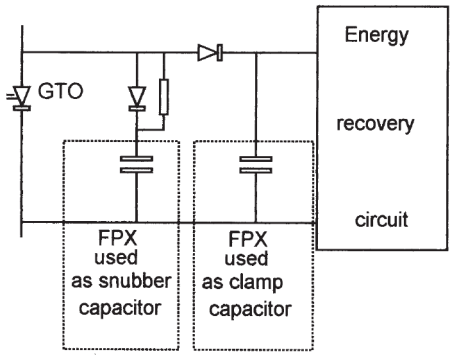


Peak voltage is given in the tables.

CLAMPING



Choice of voltage: $V_1 \leq V_{peak}$
$V_2 \leq V_n dc$



Nominal DC voltage ($V_n dc$) and peak voltage (V_{peak}) are given in the tables.

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