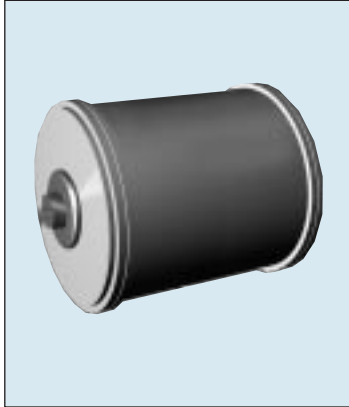


High Power Film Capacitors



PPX General Description

PROTECTION

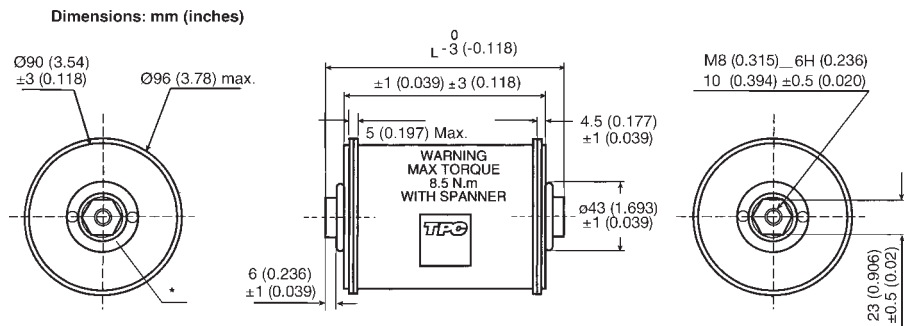


PPX capacitors are film foiled capacitors impregnated with synthetic oil (non-PCB) covering the peak voltage range, 4kVdc to 6kVdc.

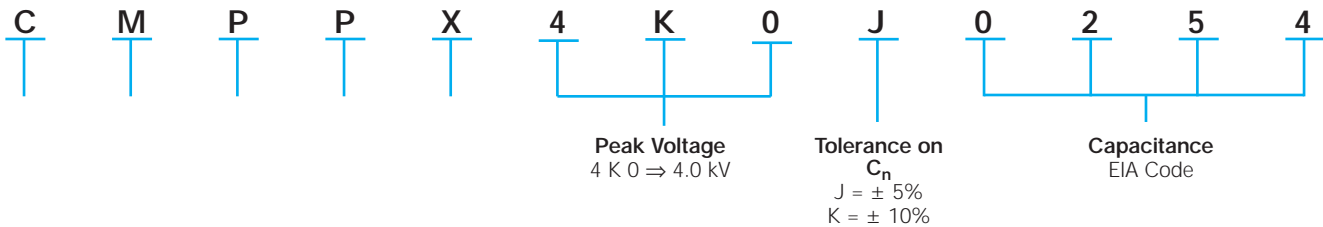
For dry-wound (non-impregnated) G.T.O. snubbers in lower voltages see our FPX product line featured on page 43 or FPG product on page 47.

APPLICATIONS

PPX capacitors are designed for the protection of gate turn-off thyristors (G.T.O.s) for operating in an air environment. Other applications are possible and available upon request.



PART NUMBER / HOW TO ORDER



ELECTRICAL CHARACTERISTICS

Capacitance range C_n	0.19 μ F to 6.4 μ F
Tolerance on C_n (possibilities of $\pm 5\%$ see specific requirements)	$\pm 10\%$
DC voltage range	3000 V / 3750 V / 4500 V
Peak voltages	4000 V / 5000 V / 6000 V
Allowable overvoltages	4500 V / 6000 V / 7500 V
Stray inductance	15 nH to 20 nH
Standard reference	Conforms with IEC 1071, IEC 68 and IEC 77
RMS test voltage between terminals V_i :	at 25°C during 10 s. See table of values
Maximum current:	$I_{peak\ max} \leq 5000\ A$
Insulation resistance:	$R_i \times C \geq 3000\ s$
Parasitic series inductance:	See table of values
Tangent of loss angle:	See Curve 1

For lower power protection devices and further information please see pages 43-FPX, 47-FPG



PROTECTION

V_n DETERMINATION

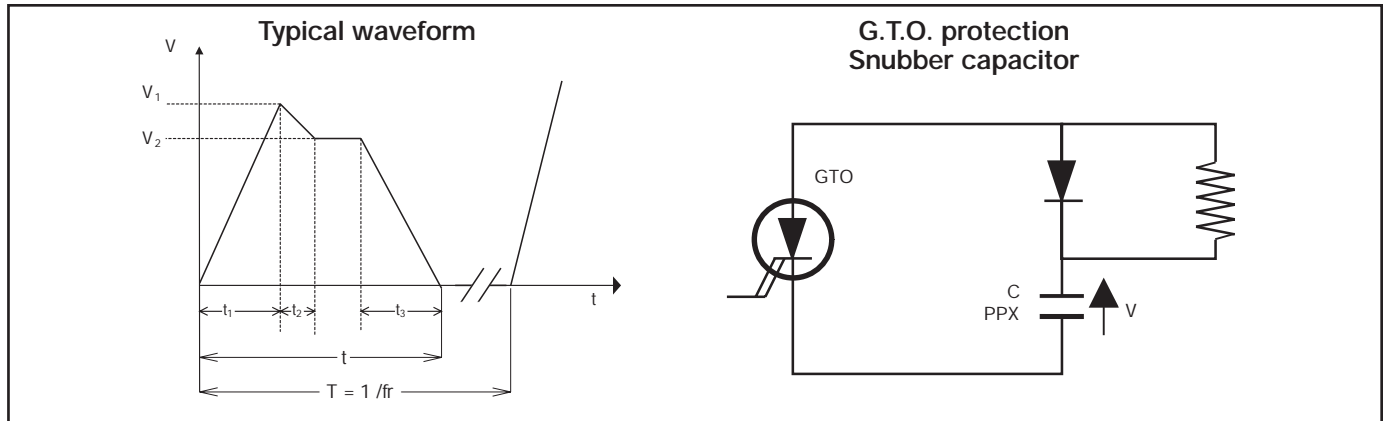
The nominal DC voltage V_n and the peak voltage V are given in the tables.

The voltage must be chosen for:

$$V_1 \leq V_{\text{peak}}$$

$$V_2 \leq V_n$$

APPLICATIONS



MARKING

This information on the label:

- Logo
- Part number
- Capacitance and tolerance in clear
- Peak voltage
- Date of manufacture

CUSTOM PARTS

This catalog shows our standard product range. If your requirement is different from the values exhibited here, either mechanically or electrically, please contact your nearest AVX

representative for assistance. We offer a wide variety of custom and semi-standard solutions at reasonable cost.

PACKAGING

Hermetically sealed cylindrical gray polypropylene case. Axial connections to reduce stray inductance.

High Power Film Capacitors



PPX Table of Values

PROTECTION

4000 V Peak

Capacitance, μF $\pm 10\%$ ($\pm 5\%$ upon request)	Peak Voltage Max. 4000 V				DC Nominal Voltage Max. 3000 V				Allowable Overvoltage 4500 V
	Dimensions millimeters (inches)				Electrical Characteristics				
	L	I	\emptyset Max.	Weight (kg)	RMS Test Voltage between terminals V _{rms} (V)	L _S Max. (nH)	Rth1 ($^{\circ}\text{C}/\text{W}$) (Typical values)	Rth2 ($^{\circ}\text{C}/\text{W}$) (Typical values)	References ($\pm 10\%$)
0.25	93 (3.66)	72 (2.83)	96 (3.78)	0.8	5000	15	8.5	0.25	CMPPX4K0K0254
0.5	93 (3.66)	72 (2.83)	96 (3.78)	0.8	4600	15	8.5	0.25	CMPPX4K0K0504
1	93 (3.66)	72 (2.83)	96 (3.78)	0.8	3200	15	8.5	0.25	CMPPX4K0K0105
1.5	93 (3.66)	72 (2.83)	96 (3.78)	0.8	3200	15	8.5	0.25	CMPPX4K0K0155
1.7 (Max.)	93 (3.66)	72 (2.83)	96 (3.78)	0.8	3200	15	8.5	0.25	CMPPX4K0K0175
2*	93 (3.66)	72 (2.83)	96 (3.78)	0.8	2900	15	8.5	0.25	CMPPX3K6K0205
2	118 (4.65)	97 (3.82)	96 (3.78)	1	3200	15	7.5	0.35	CMPPX4K0K0205
2.5	118 (4.65)	97 (3.82)	96 (3.78)	1	3200	15	7.5	0.35	CMPPX4K0K0255
2.7 (Max.)	118 (4.65)	97 (3.82)	96 (3.78)	1	3200	15	7.5	0.35	CMPPX4K0K0275
3	143 (5.63)	122 (4.80)	96 (3.78)	1.2	3200	20	6.5	0.4	CMPPX4K0K0305
3.5	143 (5.63)	122 (4.80)	96 (3.78)	1.2	3200	20	6.5	0.4	CMPPX4K0K0355
4	143 (5.63)	122 (4.80)	96 (3.78)	1.2	3200	20	6.5	0.4	CMPPX4K0K0405
4.2 (Max.)	143 (5.63)	122 (4.80)	96 (3.78)	1.2	3200	20	6.5	0.4	CMPPX4K0K0425
4.5	163 (6.42)	142 (5.59)	96 (3.78)	1.4	3200	20	6	0.45	CMPPX4K0K0455
5	163 (6.42)	142 (5.59)	96 (3.78)	1.4	3200	20	6	0.45	CMPPX4K0K0505
5.3 (Max.)	163 (6.42)	142 (5.59)	96 (3.78)	1.4	3200	20	6	0.45	CMPPX4K0K0535
6*	163 (6.42)	142 (5.59)	96 (3.78)	1.4	3000	20	6	0.45	CMPPX3K6K0605
5.5	183 (7.20)	162 (6.38)	96 (3.78)	1.6	3200	20	5.5	0.5	CMPPX4K0K0555
6	183 (7.20)	162 (6.38)	96 (3.78)	1.6	3200	20	5.5	0.5	CMPPX4K0K0605
6.4 (Max.)	183 (7.20)	162 (6.38)	96 (3.78)	1.6	3200	20	5.5	0.5	CMPPX4K0K0645

 = Preferred standard values

*Peak Voltage Max. 3600 V

5000 V Peak

Capacitance, μF $\pm 10\%$ ($\pm 5\%$ upon request)	Peak Voltage Max. 5000 V				DC Nominal Voltage Max. 3750 V				Allowable Overvoltage 6000 V
	Dimensions millimeters (inches)				Electrical Characteristics				
	L	I	\emptyset Max.	Weight (kg)	RMS Test Voltage between terminals V _{rms} (V)	L _S Max. (nH)	Rth1 ($^{\circ}\text{C}/\text{W}$) (Typical values)	Rth2 ($^{\circ}\text{C}/\text{W}$) (Typical values)	References ($\pm 10\%$)
0.25	93 (3.66)	72 (2.83)	96 (3.78)	0.8	5000	15	8.5	0.2	CMPPX5K0K0254
0.5	93 (3.66)	72 (2.83)	96 (3.78)	0.8	4400	15	8.5	0.2	CMPPX5K0K0504
0.6 (Max.)	93 (3.66)	72 (2.83)	96 (3.78)	0.8	4000	15	8.5	0.2	CMPPX5K0K0604
1	118 (4.65)	97 (3.82)	96 (3.78)	1	5000	15	7.5	0.25	CMPPX5K6K0105
1.5 (Max.)	118 (4.65)	97 (3.82)	96 (3.78)	1	4000	15	7.5	0.25	CMPPX5K0K0155
2	143 (5.63)	122 (4.80)	96 (3.78)	1.2	4400	20	6.5	0.3	CMPPX5K0K0205
2.3 (Max.)	143 (5.63)	122 (4.80)	96 (3.78)	1.2	4000	20	6.5	0.3	CMPPX5K0K0235
2.5	163 (6.42)	142 (5.59)	96 (3.78)	1.4	4400	20	6	0.35	CMPPX5K0K0255
2.8 (Max.)	163 (6.42)	142 (5.59)	96 (3.78)	1.4	4200	20	6	0.35	CMPPX5K0K0285
3	183 (7.20)	162 (6.38)	96 (3.78)	1.6	4200	20	5.5	0.4	CMPPX5K0K0305
3.5 (Max.)	183 (7.20)	162 (6.38)	96 (3.78)	1.6	4000	20	5.5	0.4	CMPPX5K0K0355

6000 V Peak

Capacitance, μF $\pm 10\%$ ($\pm 5\%$ upon request)	Peak Voltage Max. 6000 V				DC Nominal Voltage Max. 4500 V				Allowable Overvoltage 7500 V
	Dimensions millimeters (inches)				Electrical Characteristics				
	L	I	\emptyset Max.	Weight (kg)	RMS Test Voltage between terminals V _{rms} (V)	L _S Max. (nH)	Rth1 ($^{\circ}\text{C}/\text{W}$) (Typical values)	Rth2 ($^{\circ}\text{C}/\text{W}$) (Typical values)	References ($\pm 10\%$)
0.19 (Max.)	93 (3.66)	72 (2.83)	96 (3.78)	0.8	5400	15	8.5	0.25	CMPPX6K0K0194
0.25	118 (4.65)	97 (3.82)	96 (3.78)	1	5400	15	7.5	0.35	CMPPX6K0K0254
0.5	118 (4.65)	97 (3.82)	96 (3.78)	1	5400	15	7.5	0.35	CMPPX6K0K0504
0.8 (Max.)	118 (4.65)	97 (3.82)	96 (3.78)	1	5000	15	7.5	0.35	CMPPX6K0K0804
1	143 (5.63)	122 (4.80)	96 (3.78)	1.2	5400	20	6.5	0.4	CMPPX6K0K0105
1.2 (Max.)	143 (5.63)	122 (4.80)	96 (3.78)	1.2	5000	20	6.5	0.4	CMPPX6K0K0125
1.5	163 (6.42)	142 (5.59)	96 (3.78)	1.4	5000	20	6	0.45	CMPPX6K0K0155
1.6 (Max.)	163 (6.42)	142 (5.59)	96 (3.78)	1.4	5000	20	6	0.45	CMPPX6K0K0165
2	183 (7.20)	162 (6.38)	96 (3.78)	1.6	4900	20	5.5	0.5	CMPPX6K0K0205
2.2 (Max.)	183 (7.20)	162 (6.38)	96 (3.78)	1.6	4900	20	5.5	0.5	CMPPX6K0K0225

For lower power protection devices and further information please see pages 43-FPX, 47-FPG



PROTECTION

HOT SPOT TEMPERATURE

The total losses are calculated as follows:

$$P = 0.393C_n f_r [V_1^2 t_{g1}(\delta) + (V_1 - V_2)^2 t_{g2}(\delta) + V_2^2 t_{g3}(\delta)]$$

where $t_{g1}(\delta)$ at a frequency of $1/(2t_1)$
 $t_{g2}(\delta)$ at a frequency of $1/(2t_2)$
 $t_{g3}(\delta)$ at a frequency of $1/(2t_3)$
 V_1, V_2 , in kV
 C_n in μF
 f_r in Hz

The hot spot temperature can be calculated with the formula:

$$\Theta_{HS} = \frac{2PR_{th1}R_{th2} + (\Theta_{op1} + \Theta_{op2}) \times R_{th1} + 2\Theta_{amb}R_{th2}}{2 \times (R_{th1} + R_{th2})}$$

where Θ_{HS} : Hot spot temperature in $^{\circ}\text{C}$
 Θ_{amb} : Ambient temperature in $^{\circ}\text{C}$
 Θ_{op} : Output temperature in $^{\circ}\text{C}$
 R_{th1} : Thermal resistance between hot spot and ambient (given in the table of values)
 R_{th2} : Thermal resistance between hot spot and output (given in the table of values)
 P: Power in Watt

THERMAL CHARACTERISTICS

Minimum working temperature:

$$\Theta_{min} = -40^{\circ}\text{C}$$

Maximum hot spot temperature:

$$\Theta_{HSmax} = 80^{\circ}\text{C}$$

Please note that the hot spot temperature of 75°C corresponds to a lifetime expectancy of 100,000 hours. For each degree above 75 apply a decrease of lifetime of 10%.

Storage temperature:

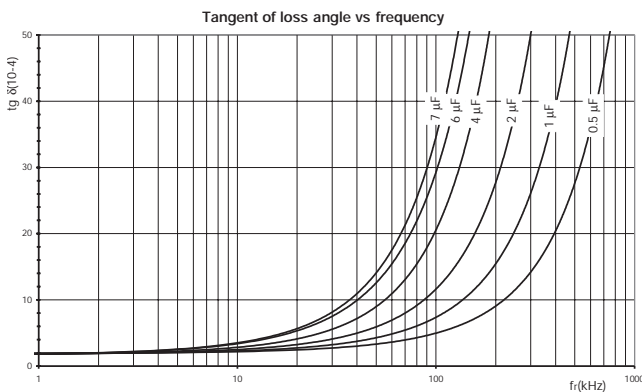
$$\text{Range} = [-55^{\circ}\text{C to } +85^{\circ}\text{C}]$$

Normative measurement temperature:

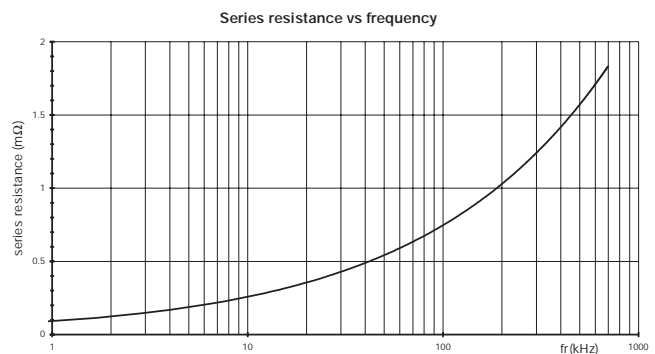
The capacitance value is given at

$$\Theta_{amb} = 25 \pm 10^{\circ}\text{C}$$

CURVE 1



CURVE 2



To request custom designs, please refer to worksheet on inside back cover.