



PPR

- MKP with double side met. current carriers
- box with radial terminals • small size • snubber
- high pulse applications • high current • high frequency



Main applications

Snubber, SCR commutating circuits, electronic ballasts, protection circuits in SMPSS, high voltage, high current and high pulse operation up to very high operating frequencies

Dielectric

Polypropylene

Electrodes

Vacuum deposited metal layers

Coating

Solvent resistant plastic case with resin sealing (UL 94 V-0). Flame retardant execution

Construction

Extended double side metallized carrier film, internal series connection and metallized film for $U_r \geq 630Vdc$ (refer to General Technical Information)

Terminals

Tinned copper wire (lead-free)

Reference standard

IEC 60384/16, IEC 60068, RoHS compliant

Climatic category

55/100/56 (IEC 60068/1), FMD (DIN40040)

Operating temperature range (case)

-55°...+105°C

Nominal Capacitance (Cn) μF

0,0022 μF to 20 μF , in compliance with IEC 60063, E6 series. Refer to article table

Capacitance tolerance (at 1kHz)

$\pm 10\%$ (code=K), $\pm 5\%$ (code=J) and $\pm 20\%$ (code=M). Other tolerances upon request

Capacitance temperature coefficient

Refer to General Technical Information

Long term stability (at 1kHz)

Capacitance variation $\leq \pm 0.5\%$ after a period of 2 years at standard environmental conditions

Rated voltage (Ur) (Vdc) at 85°C

250, 400, 630, 1000, 1600, 2000 Vdc

Permissible AC voltage at 60Hz and 75°C (Vac)

175, 230, 400, 600, 650, 700 Vac

Category voltage (Uc)

$U_c = U_r DC$ at +85°C, $U_c = U_r AC$ at +75°C

Temperature de-rated voltage

DC: for $T > +85^\circ C$, $U_r DC$ must be decreased 1,25% for every °C exceeding +85°C

AC: for $T > +75^\circ C$, $U_r AC$ must be decreased 1,35% for every °C exceeding +75°C

Self inductance

$\leq 1nH/mm$ of capacitor pitch

Maximum pulse rise time $V/\mu s$

Refer to article table. The pulse characteristic K_o depends on the voltage waveform. In any case the value given in the article table must not be exceeded

Dissipation factor (DF), max.

$tg\delta \times 10^{-4}$, measured at $25 \pm 5^\circ C$

Freq.	$C_n \leq 0.1 \mu F$	$0.1 \mu F < C_n \leq 1 \mu F$	$1 \mu F < C_n \leq 3.9 \mu F$	$C_n > 3.9 \mu F$
1kHz	5	4	5	8
10kHz	5	6	10	-
100kHz	16	-	-	-

Insulation resistance (R_{INS})

Measured between terminals, at $25 \pm 5^\circ C$, after 1 minute of electrification at 100Vdc

C_n	R_{INS}
$\leq 0.33 \mu F$	$\geq 100 G\Omega$
$> 0.33 \mu F$	$\geq 30000 s$

Test voltage between terminals (Ut)

$1,6 \times U_r$ (DC) applied for 2s at $25 \pm 5^\circ C$ (1 minute for type test)

Damp heat test (steady state)

Test conditions:

Temperature = $+40 \pm 2^\circ C$

Relative humidity = $93 \pm 2\%$

Test duration = 56 days

Performance:

Capacitance change $\leq \pm 1\%$

DF change ≤ 0.0010 at 10kHz for $C_n \leq 1 \mu F$

DF change ≤ 0.0010 at 1kHz for $C_n > 1 \mu F$

$R_{INS} \geq 50\%$ of initial limit value

Endurance test

Test conditions:

Temperature = $+85 \pm 2^\circ C$

Test duration = 2000h

Voltage applied = $1,25 \times U_r (DC)$

Performance:

Capacitance change $\leq \pm 1\%$

DF change ≤ 0.0010 at 10kHz for $C_n \leq 1 \mu F$

DF change ≤ 0.0010 at 1kHz for $C_n > 1 \mu F$

$R_{INS} \geq 50\%$ of initial limit value

Resistance to soldering heat test

Test conditions:

Solder bath temperature = $+260 \pm 5^\circ C$

Dipping time (with heat screen) = $10 \pm 1s$

Performance:

Capacitance change $\leq \pm 1\%$

DF change ≤ 0.0010 at 10kHz for $C_n \leq 1 \mu F$

DF change ≤ 0.0010 at 1kHz for $C_n > 1 \mu F$

$R_{INS} \geq 50\%$ of initial limit value

Reliability (MIL HDB 217)

Application conditions:

Applied voltage = $0,5 \times U_r (DC)$

Temperature = $+40 \pm 2^\circ C$

Failure rate: $(1FIT = 1 \times 10^{-9} \text{ failures/components} \times \text{hours}) \leq 1FIT$

Failure criteria (DIN44122):

Capacitance change $> \pm 10\%$

DF change $> 2 \times$ initial value

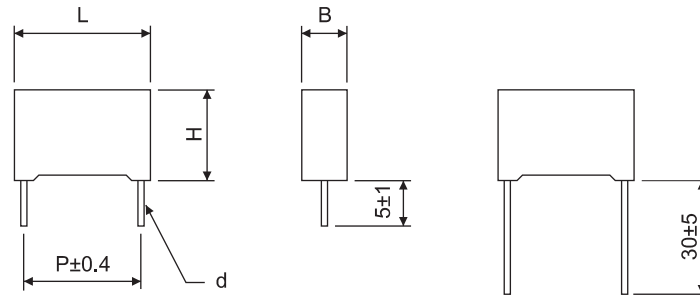
$R_{INS} < 0,005 \times$ initial limit value

Short or open circuit



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PPR article table (different values available upon request)

Voltage at +85°C		Cn μF	Dimensions (mm)					du/dt V/μs	K ₀ V ² /μs	ICEL CODE ⁽¹⁾
Ur (Vdc)	Urms (Vac) ⁽²⁾		B	H	L	P	d			
250	175	0,1	5	11	18	15	0,8	315	158000	PPR1253100*E#
250	175	0,15	6	12	18	15	0,8	315	158000	PPR1253150*E#
250	175	0,22	7,5	13,5	18	15	0,8	315	158000	PPR1253220*E#
250	175	0,27	8,5	14,5	18	15	0,8	315	158000	PPR1253270*E#
250	175	0,33	10	16	18	15	0,8	315	158000	PPR1253330*E#
250	175	0,39	10	16	18	15	0,8	315	190000	PPR1253390*E#
250	175	0,47	7	16	26,5	22,5	0,8	200	100000	PPR1253470*G#
250	175	0,68	10	18,5	26,5	22,5	0,8	200	100000	PPR1253680*G#
250	175	0,82	10	18,5	26,5	22,5	0,8	200	100000	PPR1253820*G#
250	175	0,82	9	17	32	27,5	0,8	155	77500	PPR1253820*H#
250	175	1	11	20	26,5	22,5	0,8	200	100000	PPR1254100*G#
250	175	1	11	20	32	27,5	0,8	155	77500	PPR1254100*H#
250	175	1,5	13	22	26,5	22,5	0,8	200	100000	PPR1254150*G#
250	175	1,5	13	22	32	27,5	0,8	155	77500	PPR1254150*H#
250	175	2,2	15	24,5	32	27,5	0,8	155	77500	PPR1254220*H#
250	175	3,3	18	33	32	27,5	0,8	155	77500	PPR1254330*H#
250	175	3,3	17	28	42,5	37,5	1	105	52500	PPR1254330*J#
250	175	3,9	18	33	32	27,5	0,8	155	77500	PPR1254390*H#
250	175	3,9	17	28	42,5	37,5	1	105	52500	PPR1254390*J#
250	175	4,7	22	37	32	27,5	0,8	155	77500	PPR1254470*H#
250	175	4,7	17	32	42	37,5	1	105	52500	PPR1254470*J#
250	175	5,6	22	37	32	27,5	0,8	155	77500	PPR1254560*H#
250	175	5,6	22	30	42,5	37,5	1	105	52500	PPR1254560*J#
250	175	6,8	22	33,3	42,5	37,5	1	105	52500	PPR1254680*J#
250	175	10	28	37	42,5	37,5	1	105	52500	PPR1255100*J#
250	175	15	30	45	42,5	37,5	1	105	52500	PPR1255150*J#
250	175	20	35	50	42	37,5	1,2	105	52500	PPR1255200*J#
400	230	0,047	5	11	18	15	0,8	480	384000	PPR1402470*E#
400	230	0,068	6	12	18	15	0,8	480	384000	PPR1402680*E#
400	230	0,1	7,5	13,5	18	15	0,8	480	384000	PPR1403100*E#
400	230	0,15	8,5	14,5	18	15	0,8	480	384000	PPR1403150*E#
400	230	0,22	10	16	18	15	0,8	480	384000	PPR1403220*E#
400	230	0,22	7	16	26,5	22,5	0,8	305	244000	PPR1403220*G#
400	230	0,33	8,5	17	26,5	22,5	0,8	305	244000	PPR1403330*G#
400	230	0,47	10	18,5	26,5	22,5	0,8	305	244000	PPR1403470*G#
400	230	0,47	9	17	32	27,5	0,8	235	188000	PPR1403470*H#
400	230	0,68	13	22	26,5	22,5	0,8	305	244000	PPR1403680*G#
400	230	0,68	11	20	32	27,5	0,8	235	188000	PPR1403680*H#
400	230	1	13	22	32	27,5	0,8	235	188000	PPR1404100*H#

⁽¹⁾ Change the * symbol with the needed capacitance tolerance code: J=±5%, K=±10%, M=±20% and the # symbol with S for 5mm lead length and with L for 30 mm lead length

⁽²⁾ Not suitable for across the line application.



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Ur (Vdc)	Urms (Vac) ⁽²⁾		B	H	L	P	d			
400	230	1,2	15	24,5	32	27,5	0,8	235	188000	PPR1404120*H#
400	230	1,5	18	33	32	27,5	0,8	235	188000	PPR1404150*H#
400	230	2,2	22	37	32	27,5	0,8	235	188000	PPR1404220*H#
400	230	2,2	17	28	42,5	37,5	1	160	128000	PPR1404220*J#
400	230	3,3	22	37	32	27,5	0,8	235	188000	PPR1404330*H#
400	230	3,3	22	30	42,5	37,5	1	160	128000	PPR1404330*J#
400	230	4,7	22	33,5	42,5	37,5	1	160	128000	PPR1404470*J#
400	230	5,6	28	37	42,5	37,5	1	160	128000	PPR1404560*J#
400	230	6,8	30	45	42,5	37,5	1	160	128000	PPR1404680*J#
400	230	10	35	50	42	37,5	1,2	160	128000	PPR1405100*J#
630	400	0,022	5	11	18	15	0,8	2500	3150000	PPR1632220*E#
630	400	0,033	6	12	18	15	0,8	2500	3150000	PPR1632330*E#
630	400	0,047	7,5	13,5	18	15	0,8	2500	3150000	PPR1632470*E#
630	400	0,068	8,5	14,5	18	15	0,8	2500	3150000	PPR1632680*E#
630	400	0,068	6	15	26,5	22,5	0,8	1500	1890000	PPR1632680*G#
630	400	0,1	10	16	18	15	0,8	2500	3150000	PPR1633100*E#
630	400	0,1	6	15	26,5	22,5	0,8	1500	1890000	PPR1633100*G#
630	400	0,15	8,5	17	26,5	22,5	0,8	1500	1890000	PPR1633150*G#
630	400	0,15	9	17	32	27,5	0,8	900	1130000	PPR1633150*H#
630	400	0,22	10	18,5	26,5	22,5	0,8	1500	1890000	PPR1633220*G#
630	400	0,22	9	17	32	27,5	0,8	900	1130000	PPR1633220*H#
630	400	0,33	13	22	26,5	22,5	0,8	1500	1890000	PPR1633330*G#
630	400	0,33	11	20	32	27,5	0,8	900	1130000	PPR1633330*H#
630	400	0,47	13	22	32	27,5	0,8	900	1130000	PPR1633470*H#
630	400	0,68	15	24,5	32	27,5	0,8	900	1130000	PPR1633680*H#
630	400	1	18	33	32	27,5	0,8	900	1130000	PPR1634100*H#
630	400	1	17	28	42,5	37,5	1	450	567000	PPR1634100*J#
630	400	1,5	22	37	32	27,5	0,8	900	1130000	PPR1634150*H#
630	400	1,5	22	30	42,5	37,5	1	450	567000	PPR1634150*J#
630	400	2,2	28	37	42,5	37,5	1	450	567000	PPR1634220*J#
630	400	3,3	30	45	42,5	37,5	1	450	567000	PPR1634330*J#
630	400	3,9	30	45	42,5	37,5	1	450	567000	PPR1634390*J#
630	400	4,7	35	50	42	37,5	1,2	450	567000	PPR1634470*J#
1000	600	0,01	5	11	18	15	0,8	3300	6600000	PPR2102100*E#
1000	600	0,015	6	12	18	15	0,8	3300	6600000	PPR2102150*E#
1000	600	0,022	7,5	13,5	18	15	0,8	3300	6600000	PPR2102220*E#
1000	600	0,033	8,5	14,5	18	15	0,8	3300	6600000	PPR2102330*E#
1000	600	0,033	6	15	26,5	22,5	0,8	2100	4200000	PPR2102330*G#
1000	600	0,047	7	16	26,5	22,5	0,8	2100	4200000	PPR2102470*G#
1000	600	0,068	8,5	17	26,5	22,5	0,8	2100	4200000	PPR2102680*G#
1000	600	0,1	10	18,5	26,5	22,5	0,8	2100	4200000	PPR2103100*G#
1000	600	0,1	9	17	32	27,5	0,8	1000	2000000	PPR2103100*H#
1000	600	0,15	13	22	26,5	22,5	0,8	2100	4200000	PPR2103150*G#
1000	600	0,15	11	20	32	27,5	0,8	1000	2000000	PPR2103150*H#
1000	600	0,22	13	22	32	27,5	0,8	1000	2000000	PPR2103220*H#
1000	600	0,33	14	28	32	27,5	0,8	1000	2000000	PPR2103330*H#
1000	600	0,47	18	33	32	27,5	0,8	1000	2000000	PPR2103470*H#
1000	600	0,68	22	37	32	27,5	0,8	1000	2000000	PPR2103680*H#
1000	600	0,68	22	30	42,5	37,5	1	500	1000000	PPR2103680*J#
1000	600	1	28	37	42,5	37,5	1	500	1000000	PPR2104100*J#
1000	600	1,5	28	37	42,5	37,5	1	500	1000000	PPR2104150*J#

⁽¹⁾ Change the * symbol with the needed capacitance tolerance code: J=±5%, K=±10%, M=±20% and the # symbol with S for 5mm lead length and with L for 30 mm lead length

⁽²⁾ Not suitable for across the line application.



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Ur (Vdc)	Urms (Vac) ⁽²⁾		B	H	L	P	d			
1000	600	1,8	30	45	42,5	37,5	1	500	1000000	PPR2104180*J#
1000	600	2,2	35	50	42	37,5	1,2	500	1000000	PPR2104220*J#
1600	650	0,0033	5	11	18	15	0,8	6000	19200000	PPR2161330*E#
1600	650	0,0047	5	11	18	15	0,8	6000	19200000	PPR2161470*E#
1600	650	0,0068	5	11	18	15	0,8	6000	19200000	PPR2161680*E#
1600	650	0,01	6	12	18	15	0,8	6000	19200000	PPR2162100*E#
1600	650	0,015	7,5	13,5	18	15	0,8	6000	19200000	PPR2162150*E#
1600	650	0,022	8,5	14,5	18	15	0,8	6000	19200000	PPR2162220*E#
1600	650	0,022	6	15	26,5	22,5	0,8	3000	9600000	PPR2162220*G#
1600	650	0,033	7	16	26,5	22,5	0,8	3000	9600000	PPR2162330*G#
1600	650	0,047	10	18,5	26,5	22,5	0,8	3000	9600000	PPR2162470*G#
1600	650	0,047	9	17	32	27,5	0,8	2000	6400000	PPR2162470*H#
1600	650	0,068	11	20	26,5	22,5	0,8	3000	9600000	PPR2162680*G#
1600	650	0,068	9	17	32	27,5	0,8	2000	6400000	PPR2162680*H#
1600	650	0,1	13	22	26,5	22,5	0,8	3000	9600000	PPR2163100*G#
1600	650	0,1	11	20	32	27,5	0,8	2000	6400000	PPR2163100*H#
1600	650	0,15	15	24,5	32	27,5	0,8	2000	6400000	PPR2163150*H#
1600	650	0,22	18	33	32	27,5	0,8	2000	6400000	PPR2163220*H#
1600	650	0,33	18	33	32	27,5	0,8	2000	6400000	PPR2163330*H#
1600	650	0,33	17	28	42,5	37,5	1	1200	3840000	PPR2163330*J#
1600	650	0,47	22	37	32	27,5	0,8	2000	6400000	PPR2163470*H#
1600	650	0,47	22	30	42,5	37,5	1	1200	3840000	PPR2163470*J#
1600	650	0,68	28	37	42,5	37,5	1	1200	3840000	PPR2163680*J#
1600	650	1	30	45	42,5	37,5	1	1200	3840000	PPR2164100*J#
1600	650	1,2	35	50	42	37,5	1,2	1200	3840000	PPR2164120*J#
2000	700	0,0022	5	11	18	15	0,8	7000	28000000	PPR2201220*E#
2000	700	0,0033	6	12	18	15	0,8	7000	28000000	PPR2201330*E#
2000	700	0,0047	7,5	13,5	18	15	0,8	7000	28000000	PPR2201470*E#
2000	700	0,0068	7,5	13,5	18	15	0,8	7000	28000000	PPR2201680*E#
2000	700	0,01	10	16	18	15	0,8	7000	28000000	PPR2202100*E#
2000	700	0,01	6	15	26,5	22,5	0,8	3500	14000000	PPR2202100*G#
2000	700	0,015	7	16	26,5	22,5	0,8	3500	14000000	PPR2202150*G#
2000	700	0,022	8,5	17	26,5	22,5	0,8	3500	14000000	PPR2202220*G#
2000	700	0,022	9	17	32	27,5	0,8	2300	9200000	PPR2202220*H#
2000	700	0,033	10	18,5	26,5	22,5	0,8	3500	14000000	PPR2202330*G#
2000	700	0,033	9	17	32	27,5	0,8	2300	9200000	PPR2202330*H#
2000	700	0,047	13	22	26,5	22,5	0,8	3500	14000000	PPR2202470*G#
2000	700	0,047	11	20	32	27,5	0,8	2300	9200000	PPR2202470*H#
2000	700	0,068	13	22	32	27,5	0,8	2300	9200000	PPR2202680*H#
2000	700	0,1	14	28	32	27,5	0,8	2300	9200000	PPR2203100*H#
2000	700	0,15	18	33	32	27,5	0,8	2300	9200000	PPR2203150*H#
2000	700	0,15	17	28	42,5	37,5	1	1500	6000000	PPR2203150*J#
2000	700	0,22	22	37	32	27,5	0,8	2300	9200000	PPR2203220*H#
2000	700	0,22	22	30	42,5	37,5	1	1500	6000000	PPR2203220*J#
2000	700	0,33	28	37	42,5	37,5	1	1500	6000000	PPR2203330*J#
2000	700	0,47	28	37	42,5	37,5	1	1500	6000000	PPR2203470*J#
2000	700	0,56	30	45	42,5	37,5	1	1500	6000000	PPR2203560*J#
2000	700	0,68	35	50	42	37,5	1,2	1500	6000000	PPR2203680*J#

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⁽²⁾ Not suitable for across the line application.

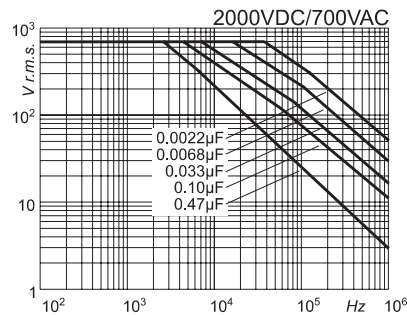
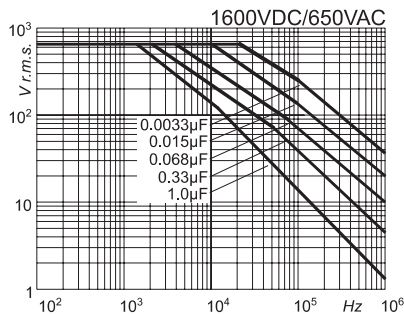
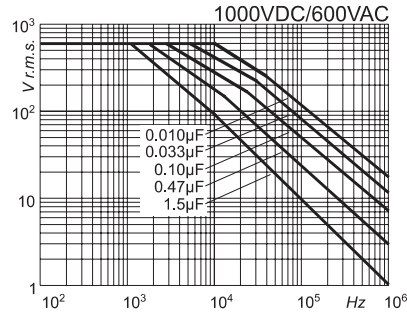
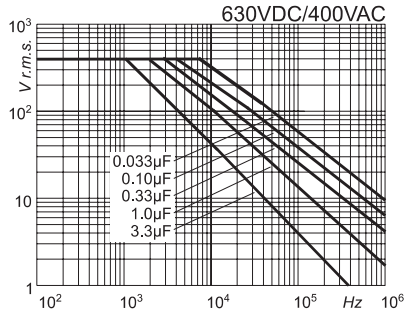


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Permissible AC voltage versus frequency (sinusoidal waveform) for $\Delta T = +10^\circ\text{C}$ Referred to the largest pitch execution among available ones



Warning: this specification must be completed with the data given in the "General technical information" chapter