

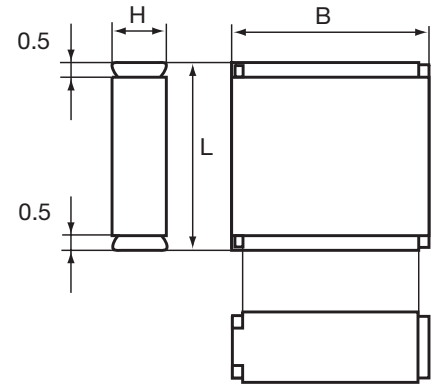
• Double metallized polyethylene naphthalate (PEN) SMD

TYPICAL APPLICATIONS

High frequency coupling and decoupling and in general high speed applications requiring high dU/dt, such as pulse operation in SMPS.

CONSTRUCTION

Film capacitor for surface mounting. Double sided metallized polyethylene naphthalate (PEN) as electrode. Clear PEN as dielectric. Rugged box encapsulation in self-extinguishing material meeting the requirements of UL 94V-0.



Components may be vertically mounted for decreased footprint. See page 69.

GENERAL DATA

Rated voltage U_R, VDC	63	100	160	250	400	630	1000
Rated voltage U_R, VAC	40	63	100	160	200	300	350
Capacitance range, nF	0.47– 1000	0.47– 1000	0.47– 680	0.47– 470	0.47– 220	0.47– 150	0.47– 68

Capacitance values In accordance with IEC E6 series. IEC E12 and other values on request.

Capacitance tolerance $\pm 20\%$, $\pm 10\%$ standard; other tolerances on request.

Category temperature range -55°C to $+125^\circ\text{C}$

Rated temperature $+100^\circ\text{C}$

Voltage derating The rated voltage is decreased with $1.25\%/^\circ\text{C}$ from $+100^\circ\text{C}$.

Climatic category 55/125/56

Voltage proof $1.6 \times U_R$, 60s

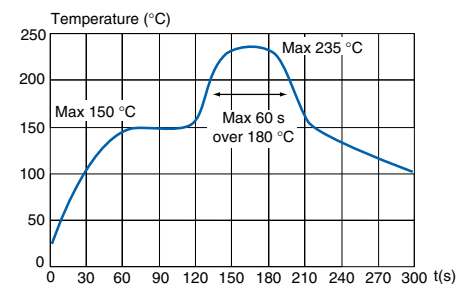
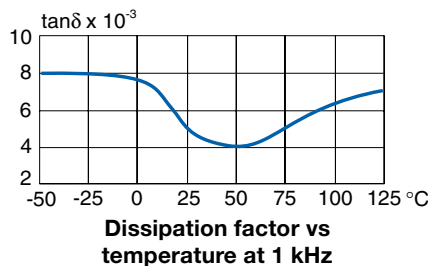
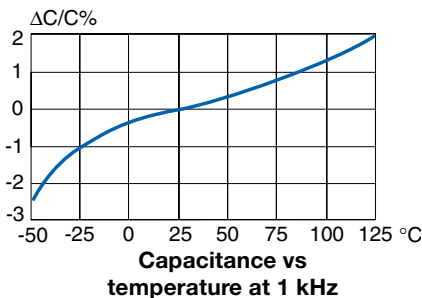
Insulation resistance Minimum value between terminals
Measured at $+20^\circ\text{C}$

$U_R \leq 100 \text{ V}$	$C \leq 0.33 \mu\text{F}$	$C > 0.33 \mu\text{F}$
$U_R > 100 \text{ V}$	10 000 M Ω	5000 s
	30 000 M Ω	10 000 s

Dissipation factor Max values at $+23^\circ\text{C}$

	$C \leq 100 \text{ nF}$	$100 \text{ nF} < C \leq 1 \mu\text{F}$	$C > 1 \mu\text{F}$
1 kHz	0.6%	0.6%	0.6%
10 kHz	1.0%	1.0%	1.2%
100 kHz	2.0%	2.5%	

Pulse rise time The capacitors can withstand an unlimited number of pulses with a dU/dt according to article table. For voltages (U) lower than the rated voltage (U_R), the specified dU/dt can be multiplied by U_R/U .



RECOMMENDED SOLDERING CONDITIONS

Electrode temperature, Reflow soldering

Preheating temperature should be less than 150°C . The time above 180°C should be less than 1 minute. The peak temperature must not exceed 235°C .

ARTICLE TABLE

Capacitance μF	Dimensions in mm ± 0.2			Quantity per package		Weight g	Max dU/dt $\text{V}/\mu\text{s}$	Article code
	B	H	L	Bulk	Reel			
63 VDC/40 VAC								
CHIP LENGTH 7.3 MM CODE 2824								
0.00047	6.0	2.5	7.3	2000	3100	0.18	400	GPC7.3 471K63K31 TR12
0.00068	6.0	2.5	7.3	2000	3100	0.18	400	GPC7.3 681K63K31 TR12
0.0010	6.0	2.5	7.3	2000	3100	0.18	400	GPC7.3 102K63K31 TR12
0.0015	6.0	2.5	7.3	2000	3100	0.18	400	GPC7.3 152K63K31 TR12
0.0022	6.0	2.5	7.3	2000	3100	0.18	400	GPC7.3 222K63K31 TR12
0.0033	6.0	2.5	7.3	2000	3100	0.18	400	GPC7.3 332K63K31 TR12
0.0047	6.0	2.5	7.3	2000	3100	0.18	400	GPC7.3 472K63K31 TR12
0.0068	6.0	2.5	7.3	2000	3100	0.18	400	GPC7.3 682K63K31 TR12
0.010	6.0	2.5	7.3	2000	3100	0.18	400	GPC7.3 103K63K31 TR12
0.015	6.0	2.5	7.3	2000	3100	0.18	400	GPC7.3 153K63K31 TR12
0.022	6.0	2.5	7.3	2000	3100	0.18	400	GPC7.3 223K63K31 TR12
0.033	6.0	3.0	7.3	2000	2500	0.22	400	GPC7.3 333K63K33 TR12
0.047	6.0	3.0	7.3	2000	2500	0.22	400	GPC7.3 473K63K33 TR12
0.068	6.0	3.5	7.3	2000	2300	0.25	400	GPC7.3 683K63K35 TR12
0.10	6.0	4.5	7.3	2000	1700	0.36	400	GPC7.3 104K63K37 TR12
CHIP LENGTHS 10.2, 12.7 AND 16.5 MM CODES 4036, 5045 AND 6560								
0.0068	9.1	5.5	10.2	1000	800	0.88	300	GPC10.2 682K63A31 TR16
0.010	9.1	5.5	10.2	1000	800	0.88	300	GPC10.2 103K63A31 TR16
0.015	9.1	5.5	10.2	1000	800	0.88	300	GPC10.2 153K63A31 TR16
0.022	9.1	5.5	10.2	1000	800	0.88	300	GPC10.2 223K63A31 TR16
0.027	9.1	5.5	10.2	1000	800	0.88	300	GPC10.2 273K63A31 TR16
0.033	9.1	5.5	10.2	1000	800	0.88	300	GPC10.2 333K63A31 TR16
0.047	9.1	5.5	10.2	1000	800	0.88	300	GPC10.2 473K63A31 TR16
0.068	9.1	5.5	10.2	1000	800	0.88	300	GPC10.2 683K63A31 TR16
0.10	9.1	5.5	10.2	1000	800	0.88	300	GPC10.2 104K63A31 TR16
0.15	9.1	5.5	10.2	1000	800	0.88	300	GPC10.2 154K63A31 TR16
0.22	9.1	5.5	10.2	1000	800	0.88	300	GPC10.2 224K63A31 TR16
0.33	9.1	5.5	10.2	1000	800	0.88	300	GPC10.2 334K63A31 TR16
0.47	11.5	6.5	12.7	1000	600	1.57	200	GPC12.7 474K63B31 TR24
0.68	15.0	7.0	16.5	800	500	2.76	100	GPC16.5 684K63C31 TR24
1.0	15.0	7.0	16.5	800	500	2.76	100	GPC16.5 105K63C31 TR24
100 VDC/63 VAC								
CHIP LENGTH 7.3 MM CODE 2824								
0.00047	6.0	2.5	7.3	2000	3100	0.18	800	GPC7.3 471K100K31 TR12
0.00068	6.0	2.5	7.3	2000	3100	0.18	800	GPC7.3 681K100K31 TR12
0.0010	6.0	2.5	7.3	2000	3100	0.18	800	GPC7.3 102K100K31 TR12
0.0015	6.0	2.5	7.3	2000	3100	0.18	800	GPC7.3 152K100K31 TR12
0.0022	6.0	2.5	7.3	2000	3100	0.18	800	GPC7.3 222K100K31 TR12
0.0033	6.0	2.5	7.3	2000	3100	0.18	800	GPC7.3 332K100K31 TR12
0.0047	6.0	2.5	7.3	2000	3100	0.18	800	GPC7.3 472K100K31 TR12
0.0068	6.0	2.5	7.3	2000	3100	0.18	800	GPC7.3 682K100K31 TR12
0.010	6.0	2.5	7.3	2000	3100	0.18	800	GPC7.3 103K100K31 TR12
0.015	6.0	3.0	7.3	2000	2500	0.22	800	GPC7.3 153K100K33 TR12
0.022	6.0	3.0	7.3	2000	2500	0.22	800	GPC7.3 223K100K33 TR12
0.033	6.0	3.5	7.3	2000	2300	0.25	800	GPC7.3 333K100K35 TR12
0.047	6.0	4.5	7.3	2000	1700	0.36	800	GPC7.3 473K100K37 TR12
CHIP LENGTHS 10.2, 12.7 AND 16.5 MM CODES 4036, 5045 AND 6560								
0.0068	9.1	5.5	10.2	1000	800	0.88	600	GPC10.2 682K100A31 TR16
0.010	9.1	5.5	10.2	1000	800	0.88	600	GPC10.2 103K100A31 TR16
0.015	9.1	5.5	10.2	1000	800	0.88	600	GPC10.2 153K100A31 TR16
0.022	9.1	5.5	10.2	1000	800	0.88	600	GPC10.2 223K100A31 TR16
0.027	9.1	5.5	10.2	1000	800	0.88	600	GPC10.2 273K100A31 TR16
0.033	9.1	5.5	10.2	1000	800	0.88	600	GPC10.2 333K100A31 TR16
0.047	9.1	5.5	10.2	1000	800	0.88	600	GPC10.2 473K100A31 TR16

ARTICLE TABLE

Capacitance μF	Dimensions in mm ± 0.2			Quantity per package		Weight g	Max dU/dt V/ μs	Article code
	B	H	L	Bulk	Reel			
100 VDC/63 VAC								
CHIP LENGTHS 10.2, 12.7 AND 16.5 MM CODES 4036, 5045 AND 6560								
0.068	9.1	5.5	10.2	1000	800	0.88	600	GPC10.2 683K100A31 TR16
0.10	9.1	5.5	10.2	1000	800	0.88	600	GPC10.2 104K100A31 TR16
0.15	9.1	5.5	10.2	1000	800	0.88	600	GPC10.2 154K100A31 TR16
0.22	11.5	6.5	12.7	1000	600	1.57	400	GPC12.7 224K100B31 TR24
0.33	11.5	6.5	12.7	1000	600	1.57	400	GPC12.7 334K100B31 TR24
0.47	15.0	7.0	16.5	800	500	2.76	150	GPC16.5 474K100C31 TR24
0.68	15.0	7.0	16.5	800	500	2.76	150	GPC16.5 684K100C31 TR24
1.0	15.0	7.0	16.5	800	500	2.76	150	GPC16.5 105K100C31 TR24
160 VDC/100 VAC								
CHIP LENGTH 7.3 MM CODE 2824								
0.00047	6.0	2.5	7.3	2000	3100	0.18	1000	GPC7.3 471K160K31 TR12
0.00068	6.0	2.5	7.3	2000	3100	0.18	1000	GPC7.3 681K160K31 TR12
0.0010	6.0	2.5	7.3	2000	3100	0.18	1000	GPC7.3 102K160K31 TR12
0.0015	6.0	2.5	7.3	2000	3100	0.18	1000	GPC7.3 152K160K31 TR12
0.0022	6.0	2.5	7.3	2000	3100	0.18	1000	GPC7.3 222K160K31 TR12
0.0033	6.0	2.5	7.3	2000	3100	0.18	1000	GPC7.3 332K160K31 TR12
0.0047	6.0	2.5	7.3	2000	3100	0.18	1000	GPC7.3 472K160K31 TR12
0.0068	6.0	2.5	7.3	2000	3100	0.18	1000	GPC7.3 682K160K31 TR12
0.010	6.0	3.0	7.3	2000	2500	0.22	1000	GPC7.3 103K160K33 TR12
0.015	6.0	3.0	7.3	2000	2500	0.22	1000	GPC7.3 153K160K33 TR12
0.022	6.0	3.5	7.3	2000	2300	0.25	1000	GPC7.3 223K160K35 TR12
0.033	6.0	4.5	7.3	2000	1700	0.36	1000	GPC7.3 333K160K37 TR12
CHIP LENGTHS 10.2, 12.7 AND 16.5 MM CODES 4036, 5045 AND 6560								
0.0068	9.1	5.5	10.2	1000	800	0.88	800	GPC10.2 682K160A31 TR16
0.010	9.1	5.5	10.2	1000	800	0.88	800	GPC10.2 103K160A31 TR16
0.015	9.1	5.5	10.2	1000	800	0.88	800	GPC10.2 153K160A31 TR16
0.022	9.1	5.5	10.2	1000	800	0.88	800	GPC10.2 223K160A31 TR16
0.027	9.1	5.5	10.2	1000	800	0.88	800	GPC10.2 273K160A31 TR16
0.033	9.1	5.5	10.2	1000	800	0.88	800	GPC10.2 333K160A31 TR16
0.047	9.1	5.5	10.2	1000	800	0.88	800	GPC10.2 473K160A31 TR16
0.068	9.1	5.5	10.2	1000	800	0.88	800	GPC10.2 683K160A31 TR16
0.10	9.1	5.5	10.2	1000	800	0.88	800	GPC10.2 104K160A31 TR16
0.15	11.5	6.5	12.7	1000	600	1.57	600	GPC12.7 154K160B31 TR24
0.22	11.5	6.5	12.7	1000	600	1.57	600	GPC12.7 224K160B31 TR24
0.33	15.0	7.0	16.5	800	500	2.76	250	GPC16.5 334K160C31 TR24
0.47	15.0	7.0	16.5	800	500	2.76	250	GPC16.5 474K160C31 TR24
0.68	15.0	7.0	16.5	800	500	2.76	250	GPC16.5 684K160C31 TR24
250 VDC/160 VAC								
CHIP LENGTH 7.3 MM CODE 2824								
0.00047	6.0	2.5	7.3	2000	3100	0.18	1200	GPC7.3 471K250K31 TR12
0.00068	6.0	2.5	7.3	2000	3100	0.18	1200	GPC7.3 681K250K31 TR12
0.0010	6.0	2.5	7.3	2000	3100	0.18	1200	GPC7.3 102K250K31 TR12
0.0015	6.0	2.5	7.3	2000	3100	0.18	1200	GPC7.3 152K250K31 TR12
0.0022	6.0	2.5	7.3	2000	3100	0.18	1200	GPC7.3 222K250K31 TR12
0.0033	6.0	2.5	7.3	2000	3100	0.18	1200	GPC7.3 332K250K31 TR12
0.0047	6.0	2.5	7.3	2000	3100	0.18	1200	GPC7.3 472K250K31 TR12
0.0068	6.0	3.0	7.3	2000	2500	0.22	1200	GPC7.3 682K250K33 TR12
0.010	6.0	3.0	7.3	2000	2500	0.22	1200	GPC7.3 103K250K33 TR12
0.015	6.0	3.5	7.3	2000	2300	0.25	1200	GPC7.3 153K250K35 TR12
0.022	6.0	4.5	7.3	2000	1700	0.36	1200	GPC7.3 223K250K37 TR12

ARTICLE TABLE

Capacitance μF	Dimensions in mm ± 0.2			Quantity per package		Weight g	Max dU/dt V/ μs	Article code
	B	H	L	Bulk	Reel			
250 VDC/160 VAC								
CHIP LENGTHS 10.2, 12.7 AND 16.5 MM CODES 4036, 5045 AND 6560								
0.0068	9.1	5.5	10.2	1000	800	0.88	1000	GPC10.2 682K250A31 TR16
0.010	9.1	5.5	10.2	1000	800	0.88	1000	GPC10.2 103K250A31 TR16
0.015	9.1	5.5	10.2	1000	800	0.88	1000	GPC10.2 153K250A31 TR16
0.022	9.1	5.5	10.2	1000	800	0.88	1000	GPC10.2 223K250A31 TR16
0.027	9.1	5.5	10.2	1000	800	0.88	1000	GPC10.2 273K250A31 TR16
0.033	9.1	5.5	10.2	1000	800	0.88	1000	GPC10.2 333K250A31 TR16
0.047	9.1	5.5	10.2	1000	800	0.88	1000	GPC10.2 473K250A31 TR16
0.068	9.1	5.5	10.2	1000	800	0.88	1000	GPC10.2 683K250A31 TR16
0.10	11.5	6.5	12.7	1000	600	1.57	700	GPC12.7 104K250B31 TR24
0.15	11.5	6.5	12.7	1000	600	1.57	700	GPC12.7 154K250B31 TR24
0.22	15.0	7.0	16.5	800	500	2.76	350	GPC16.5 224K250C31 TR24
0.33	15.0	7.0	16.5	800	500	2.76	350	GPC16.5 334K250C31 TR24
0.47	15.0	7.0	16.5	800	500	2.76	350	GPC16.5 474K250C31 TR24

400 VDC/200 VAC**CHIP LENGTH 7.3 MM CODE 2824**

0.00047	6.0	2.5	7.3	2000	3100	0.18	1600	GPC7.3 471K400K31 TR12
0.00068	6.0	2.5	7.3	2000	3100	0.18	1600	GPC7.3 681K400K31 TR12
0.0010	6.0	2.5	7.3	2000	3100	0.18	1600	GPC7.3 102K400K31 TR12
0.0015	6.0	2.5	7.3	2000	3100	0.18	1600	GPC7.3 152K400K31 TR12
0.0022	6.0	2.5	7.3	2000	3100	0.18	1600	GPC7.3 222K400K31 TR12
0.0033	6.0	2.5	7.3	2000	3100	0.18	1600	GPC7.3 332K400K31 TR12
0.0047	6.0	3.0	7.3	2000	2500	0.22	1600	GPC7.3 472K400K33 TR12
0.0068	6.0	3.5	7.3	2000	2300	0.25	1600	GPC7.3 682K400K35 TR12
0.010	6.0	4.5	7.3	2000	1700	0.36	1600	GPC7.3 103K400K37 TR12

CHIP LENGTHS 10.2, 12.7 AND 16.5 MM CODES 4036, 5045 AND 6560

0.0068	9.1	5.5	10.2	1000	800	0.88	1300	GPC10.2 682K400A31 TR16
0.010	9.1	5.5	10.2	1000	800	0.88	1300	GPC10.2 103K400A31 TR16
0.015	9.1	5.5	10.2	1000	800	0.88	1300	GPC10.2 153K400A31 TR16
0.022	9.1	5.5	10.2	1000	800	0.88	1300	GPC10.2 223K400A31 TR16
0.027	9.1	5.5	10.2	1000	800	0.88	1300	GPC10.2 273K400A31 TR16
0.033	11.5	6.5	12.7	1000	600	1.57	900	GPC12.7 333K400B31 TR24
0.047	11.5	6.5	12.7	1000	600	1.57	900	GPC12.7 473K400B31 TR24
0.068	11.5	6.5	12.7	1000	600	1.57	900	GPC12.7 683K400B31 TR24
0.10	15.0	7.0	16.5	800	500	2.76	450	GPC16.5 104K400C31 TR24
0.15	15.0	7.0	16.5	800	500	2.76	450	GPC16.5 154K400C31 TR24
0.22	15.0	7.0	16.5	800	500	2.76	450	GPC16.5 224K400C31 TR24

630 VDC/300 VAC**CHIP LENGTH 7.3 MM CODE 2824**

0.00047	6.0	2.5	7.3	2000	3100	0.18	2000	GPC7.3 471K630K31 TR12
0.00068	6.0	2.5	7.3	2000	3100	0.18	2000	GPC7.3 681K630K31 TR12
0.0010	6.0	2.5	7.3	2000	3100	0.18	2000	GPC7.3 102K630K31 TR12
0.0015	6.0	2.5	7.3	2000	3100	0.18	2000	GPC7.3 152K630K31 TR12
0.0022	6.0	3.0	7.3	2000	2500	0.22	2000	GPC7.3 222K630K33 TR12
0.0033	6.0	3.0	7.3	2000	2500	0.22	2000	GPC7.3 332K630K33 TR12
0.0047	6.0	3.5	7.3	2000	2300	0.25	2000	GPC7.3 472K630K35 TR12
0.0068	6.0	4.5	7.3	2000	1700	0.36	2000	GPC7.3 682K630K37 TR12

ARTICLE TABLE

Capacitance μF	Dimensions in mm ± 0.2			Quantity per package		Weight g	Max dU/dt V/ μs	Article code
	B	H	L	Bulk	Reel			
630 VDC/300 VAC								
CHIP LENGTHS 10.2, 12.7 AND 16.5 MM CODES 4036, 5045 AND 6560								
0.0068	9.1	5.5	10.2	1000	800	0.88	1600	GPC10.2 682K630A31 TR16
0.010	9.1	5.5	10.2	1000	800	0.88	1600	GPC10.2 103K630A31 TR16
0.015	9.1	5.5	10.2	1000	800	0.88	1600	GPC10.2 153K630A31 TR16
0.022	9.1	5.5	10.2	1000	800	0.88	1600	GPC10.2 223K630A31 TR16
0.033	11.5	6.5	12.7	1000	600	1.57	1100	GPC12.7 333K630B31 TR24
0.047	11.5	6.5	12.7	1000	600	1.57	1100	GPC12.7 473K630B31 TR24
0.068	15.0	7.0	16.5	800	500	2.76	550	GPC16.5 683K630C31 TR24
0.10	15.0	7.0	16.5	800	500	2.76	550	GPC16.5 104K630C31 TR24
1000 VDC/350 VAC								
CHIP LENGTH 7.3 MM CODE 2824								
0.00047	6.0	2.5	7.3	2000	3100	0.18	2200	GPC7.3 471K1000K31 TR12
0.00068	6.0	2.5	7.3	2000	3100	0.18	2200	GPC7.3 681K1000K31 TR12
0.0010	6.0	2.5	7.3	2000	3100	0.18	2200	GPC7.3 102K1000K31 TR12
0.0015	6.0	3.0	7.3	2000	2500	0.22	2200	GPC7.3 152K1000K33 TR12
0.0022	6.0	3.0	7.3	2000	2500	0.22	2200	GPC7.3 222K1000K33 TR12
0.0033	6.0	3.5	7.3	2000	2300	0.25	2200	GPC7.3 332K1000K35 TR12
0.0047	6.0	4.5	7.3	2000	1700	0.36	2200	GPC7.3 472K1000K37 TR12
CHIP LENGTHS 10.2, 12.7 AND 16.5 MM CODES 4036, 5045 AND 6560								
0.0068	9.1	5.5	10.2	1000	800	0.88	1700	GPC10.2 682K1000A31 TR16
0.010	9.1	5.5	10.2	1000	800	0.88	1700	GPC10.2 103K1000A31 TR16
0.015	9.1	5.5	10.2	1000	800	0.88	1700	GPC10.2 153K1000A31 TR16
0.022	11.5	6.5	12.7	1000	600	1.57	1200	GPC12.7 223K1000B31 TR24
0.033	11.5	6.5	12.7	1000	600	1.57	1200	GPC12.7 333K1000B31 TR24
0.047	15.0	7.0	16.5	800	500	2.76	600	GPC16.5 473K1000C31 TR24
0.068	15.0	7.0	16.5	800	500	2.76	600	GPC16.5 683K1000C31 TR24

ORDERING INFORMATION

See article table and pages 18 to 23 for options and article code construction.

MARKING

- Rated capacitance
- Capacitance tolerance code
- Rated voltage code
- Capacitor type P for GPC
- Manufacturing date code according to IEC 60062 (year, month)

See also page 68.