

# General Purpose Capacitors

## GPR Series



### Features

- Wide CV value range for general purpose
- Safely vent construction products, GPR series are guaranteed 2,000 hours at 85°C

### Specifications

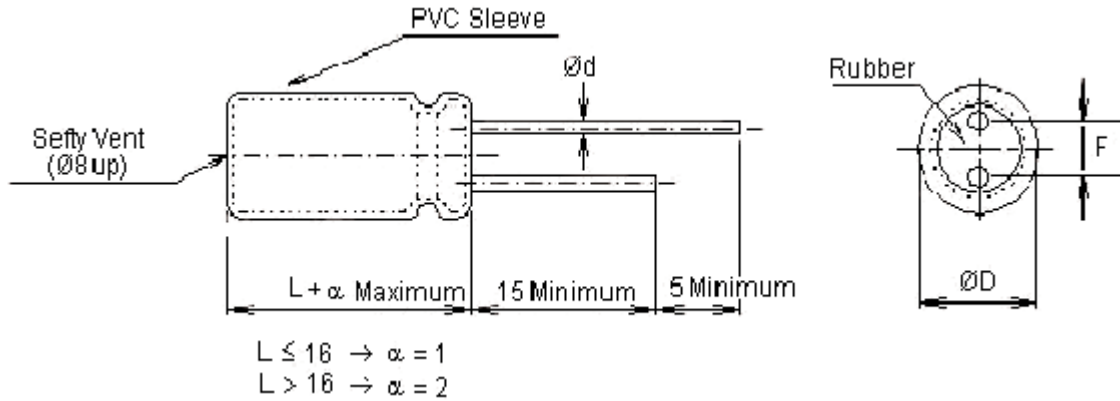
Item	Performance																								
Operating Temperature Range	-40°C to +85°C																								
Rated Working Voltage Range	10 to 100V DC																								
Nominal Capacitance Range	0.1 to 22,000µF																								
Capacitance Tolerance	± 20% (at +20°C, 120 Hz)																								
Leakage Current	<p>I = 0.01CV or 3 (µA) Max.</p> <p>Which ever is greater after 3 mins.</p> <p>I : Leakage Current(µA) C : Rated Capacitance(µF) V : Working Voltage(v)</p>																								
Dissipation Factor (tan δ) (120Hz \ +20°C)	<table border="1"> <thead> <tr> <th>Working voltage (V)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> </tr> </thead> <tbody> <tr> <td><b>tan δ Max.</b></td> <td>0.2</td> <td>0.17</td> <td>0.15</td> <td>0.12</td> <td>0.1</td> <td>0.09</td> <td>0.08</td> </tr> </tbody> </table> <p>Add 0.02 per 1,000 µF for more than 1,000 µF</p>	Working voltage (V)	10	16	25	35	50	63	100	<b>tan δ Max.</b>	0.2	0.17	0.15	0.12	0.1	0.09	0.08								
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<b>tan δ Max.</b>	0.2	0.17	0.15	0.12	0.1	0.09	0.08																		
Ripple Current	<p>Refer to standard products table (120Hz, +85°C) Correction factor for frequency.</p> <table border="1"> <thead> <tr> <th>Frequency (Hz)</th> <th>50 / 60</th> <th>120</th> <th>1 K</th> <th>10 K</th> </tr> </thead> <tbody> <tr> <td><b>Correction Factor (Multiplier)</b></td> <td>0.7</td> <td>1</td> <td>1.3</td> <td>1.7</td> </tr> </tbody> </table>	Frequency (Hz)	50 / 60	120	1 K	10 K	<b>Correction Factor (Multiplier)</b>	0.7	1	1.3	1.7														
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Characteristics at High and Low Temperature (Stability at 120 Hz)	<table border="1"> <thead> <tr> <th>Working voltage (V)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> </tr> </thead> <tbody> <tr> <td><b>-25°C / +20°C</b></td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td><b>-40°C / +20°C</b></td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table> <p>For capacitance value &gt; 1,000 µF, Add 0.5 per another 1,000 µF for -25°C / +25°C. Add 1 per another 1,000 µF for -40°C / +20°C.</p>	Working voltage (V)	10	16	25	35	50	63	100	<b>-25°C / +20°C</b>	3	2	2	2	2	2	2	<b>-40°C / +20°C</b>	6	4	4	3	3	3	3
Working voltage (V)	10	16	25	35	50	63	100																		
<b>-25°C / +20°C</b>	3	2	2	2	2	2	2																		
<b>-40°C / +20°C</b>	6	4	4	3	3	3	3																		
High Temperature Loading	<p>After 2,000 hours application of DC rated working voltage at +85°C, The capacitor shall meet the following limits: Post test requirements at +20°C.</p> <table border="1"> <tbody> <tr> <td>Leakage current</td> <td>≤ the initial specified value</td> </tr> <tr> <td>Capacitance change</td> <td>≤ ±20% of initial measured value</td> </tr> <tr> <td>Dissipation factor (tan δ)</td> <td>≤ 150% of initial specified value</td> </tr> </tbody> </table>	Leakage current	≤ the initial specified value	Capacitance change	≤ ±20% of initial measured value	Dissipation factor (tan δ)	≤ 150% of initial specified value																		
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Shelf Life	<p>After storage for 500 hours at +85°C with no voltage applied. Post test requirements at +20°C same limits as high temperature loading.</p>																								

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### Diagram of Dimensions



Dimensions : Millimetres

ØD (+0.5 Max.)	5	6.3	8	10	13	16	18	22	25
F (±0.5)	2	2.5	3.5	5	5	7.5	7.5	10	12
Ød (±0.02)	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.8	0.8

### Case Size Table

Ø D x L (mm)

W V (SV) µF	10 (13)	16 (20)	25 (32)	35 (44)	50 (63)	63 (79)	100 (125)	
0.1	-	-	-	→	5 × 11	-	5 × 11	
0.22	-	-	-	→		-		
0.33	-	-	-	→		-		
0.47	-	-	-	→		-		
1	-	-	-	→		-		
2.2	-	-	-	→		-		
3.3	-	-	-	→		-		
4.7	-	-	-	→		-		
10	-	→	5 × 11	5 × 11	6.3 × 11	5 × 11	6.3 × 11	
22	-	→				6.3 × 11	8 × 11	
33	→	5 × 11			6.3 × 11	6.3 × 11	8 × 11	10 × 13
47	→						8 × 11	10 × 16
100	5 × 11	6.3 × 11	6.3 × 11	8 × 11	8 × 11	10 × 13	13 × 21	
220	6.3 × 11		8 × 11	10 × 13	10 × 16	10 × 21	16 × 26	
330		8 × 11	10 × 13	10 × 16	10 × 21	13 × 21	16 × 26	
470			10 × 16		13 × 21	13 × 26	16 × 32	
1,000	10 × 13	10 × 16	10 × 21	13 × 21	16 × 26	16 × 32	18 × 42	



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W V (SV) µF	10 (13)	16 (20)	25 (32)	35 (44)	50 (63)	63 (79)	100 (125)
2,200	10 × 21	13 × 21	13 × 26	16 × 26	16 × 36	18 × 36	25 × 50
3,300	13 × 21	13 × 26	16 × 26	16 × 36	18 × 36	22 × 42	-
4,700	13 × 26	16 × 26	16 × 36	18 × 36	22 × 41	25 × 50	-
6,800	16 × 26	16 × 36	18 × 36	22 × 41	25 × 50	30 × 46	-
8,200	18 × 36	18 × 42	22 × 46	22 × 50	30 × 46	-	-
10,000	18 × 32	18 × 36	22 × 41	25 × 50	-	-	-
15,000	18 × 36	22 × 50	25 × 50	-	-	-	-
22,000	22 × 50	25 × 50	30 × 46	-	-	-	-
8,200	18 × 36	18 × 42	22 × 46	22 × 50	30 × 46	-	-
10,000	18 × 32	18 × 36	22 × 41	25 × 50		-	-
15,000	18 × 36	22 × 50	25 × 50	-	-	-	-
22,000	22 × 50	25 × 50	30 × 46	-	-	-	-

Dimensions : Millimetres

- All blank voltage on sleeve marking is the same voltage as  $\mu\text{S} \rightarrow \mu\text{F}$  point to.

### Permissible Ripple Current

Maximum Ripple Current : mA (rms) (at 85°C 120 Hz)

W V (SV) µF	10 (13)	16 (20)	25 (32)	35 (44)	50 (63)	63 (79)	100 (125)
0.1-0.47	-	-	-	-	8	-	10
1	-	-	-	-	13	-	16
2.2	-	-	-	-	21	-	27
3.3	-	-	-	-	30	-	40
4.7	-	-	30	35	40	40	45
10	-	45	45	50	60	65	75
22	60	60	70	80	90	110	130
33	75	85	95	105	120	140	170
47	90	100	120	135	150	180	230
100	140	170	180	220	250	280	380
150	220	240	310	350	400	450	550
220	240	280	320	380	430	490	680
330	320	360	420	480	540	680	800
470	400	460	540	620	750	880	1,000
560	500	580	670	770	880	1,050	1,170
680	570	660	760	870	1,000	1,160	1,330
820	640	740	850	970	1,130	1,300	1,500



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W V (SV) µF	10 (13)	16 (20)	25 (32)	35 (44)	50 (63)	63 (79)	100 (125)
1,000	660	760	900	1,040	1,260	1,400	1,970
2,200	1,050	1,250	1,460	1,700	1,900	2,460	3,390
3,300	1,340	1,620	1,800	2,060	2,180	3,270	-
4,700	1,720	1,960	2,150	2,280	3,380	3,800	-
6,800	2,060	2,250	2,400	3,490	4,110	4,500	-
8,200	2,520	2,870	3,420	3,780	4,150	-	-
10,000	2,640	2,980	3,710	4,170	4,300	-	-
15,000	3,120	3,890	4,270	-	-	-	-
22,000	4,010	4,410	4,500	-	-	-	-

Dimensions : Millimetres

### Part Number Table

Description	Part Number
CAPACITOR, 100uF, 10V	MCGPR10V107M5X11
CAPACITOR, 220uF, 10V	MCGPR10V227M6.3X11
CAPACITOR, 470uF, 10V	MCGPR10V477M8X11
CAPACITOR, 1000uF, 10V	MCGPR10V108M8X14
CAPACITOR, 2200uF, 10V	MCGPR10V228M10X21
CAPACITOR, 4700uF, 10V	MCGPR10V478M13X26
CAPACITOR, 10UF, 16V	MCGPR16V106M5X11
CAPACITOR, 22UF, 16V	MCGPR16V226M5X11
CAPACITOR, 33uF, 16V	MCGPR16V336M5X11
CAPACITOR, 47UF, 16V	MCGPR16V476M5X11
CAPACITOR, 100UF, 16V	MCGPR16V107M6.3X11
CAPACITOR, 220UF, 16V	MCGPR16V227M6.3X11
CAPACITOR, 330UF, 16V	MCGPR16V337M8X11
CAPACITOR, 470UF, 16V	MCGPR16V477M8X11
CAPACITOR, 1000UF, 16V	MCGPR16V108M10X16
CAPACITOR, 2200UF, 16V	MCGPR16V228M13X21
CAPACITOR, 3300uF, 16V	MCGPR16V338M13X26
CAPACITOR, 4700UF, 16V	MCGPR16V478M16X26
CAPACITOR, 10UF, 25V	MCGPR25V106M5X11
CAPACITOR, 22UF, 25V	MCGPR25V226M5X11
CAPACITOR, 33UF, 25V	MCGPR25V336M5X11

Description	Part Number
CAPACITOR, 47UF, 25V	MCGPR25V476M5X11
CAPACITOR, 100UF, 25V	MCGPR25V107M6.3X11
CAPACITOR, 220UF, 25V	MCGPR25V227M8X11
CAPACITOR, 330UF, 25V	MCGPR25V337M8X14
CAPACITOR, 470UF, 25V	MCGPR25V477M10X16
CAPACITOR, 1000UF, 25V	MCGPR25V108M10X21
CAPACITOR, 2200UF, 25V	MCGPR25V228M13X26
CAPACITOR, 3300UF, 25V	MCGPR25V338M16X26
CAPACITOR, 4700UF, 25V	MCGPR25V478M16X32
CAPACITOR, 4.7UF, 35V	MCGPR35V475M5X11
CAPACITOR, 10UF, 35V	MCGPR35V106M5X11
CAPACITOR, 22UF, 35V	MCGPR35V226M5X11
CAPACITOR, 33UF, 35V	MCGPR35V336M5X11
CAPACITOR, 47UF, 35V	MCGPR35V476M6.3X11
CAPACITOR, 100UF, 35V	MCGPR35V107M8X11
CAPACITOR, 220UF, 35V	MCGPR35V227M10X13
CAPACITOR, 330UF, 35V	MCGPR35V337M10X16
CAPACITOR, 470UF, 35V	MCGPR35V477M10X21
CAPACITOR, 1000UF, 35V	MCGPR35V108M13X21
CAPACITOR, 2200UF, 35V	MCGPR35V228M16X32
CAPACITOR, 3300UF, 35V	MCGPR35V338M16X32

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### Part Number Table

Description	Part Number
CAPACITOR, 4700UF, 35V	MCGPR35V478M18X36
CAPACITOR, 0.47UF, 50V	MCGPR50V474M5X11
CAPACITOR, 1UF, 50V	MCGPR50V105M5X11
CAPACITOR, 2.2UF, 50V	MCGPR50V225M5X11
CAPACITOR, 3.3UF, 50V	MCGPR50V335M5X11
CAPACITOR, 4.7UF, 50V	MCGPR50V475M5X11
CAPACITOR, 10UF, 50V	MCGPR50V106M5X11
CAPACITOR, 22UF, 50V	MCGPR50V226M5X11
CAPACITOR, 33UF, 50V	MCGPR50V336M6.3X11
CAPACITOR, 47UF, 50V	MCGPR50V476M6.3X11
CAPACITOR, 100UF, 50V	MCGPR50V107M8X11
CAPACITOR, 220UF, 50V	MCGPR50V227M10X16
CAPACITOR, 330UF, 50V	MCGPR50V337M10X21
CAPACITOR, 470UF, 50V	MCGPR50V477M13X21
CAPACITOR, 1000UF, 50V	MCGPR50V108M16X26
CAPACITOR, 2200UF, 50V	MCGPR50V228M16X32
CAPACITOR, 3300UF, 50V	MCGPR50V338M18X33
CAPACITOR, 4700UF, 50V	MCGPR50V478M22X41
CAPACITOR, 1UF, 63V	MCGPR63V105M5X11
CAPACITOR, 2.2UF, 63V	MCGPR63V225M5X11

Description	Part Number
CAPACITOR, 4.7UF, 63V	MCGPR63V475M5X11
CAPACITOR, 10UF, 63V	MCGPR63V106M5X11
CAPACITOR, 22UF, 63V	MCGPR63V226M6.3X11
CAPACITOR, 47UF, 63V	MCGPR63V476M8X11
CAPACITOR, 100UF, 63V	MCGPR63V107M10X13
CAPACITOR, 220UF, 63V	MCGPR63V227M10X21
CAPACITOR, 470UF, 63V	MCGPR63V477M13X26
CAPACITOR, 1000UF, 63V	MCGPR63V108M16X32
CAPACITOR, 2200UF, 63V	MCGPR63V228M18X36
CAPACITOR, 4700UF, 63V	MCGPR63V478M25X42
CAPACITOR, 1UF, 100V	MCGPR100V105M5X11
CAPACITOR, 2.2UF, 100V	MCGPR100V225M5X11
CAPACITOR, 4.7UF, 100V	MCGPR100V475M5X11
CAPACITOR, 10UF, 100V	MCGPR100V106M6.3X11
CAPACITOR, 22UF, 100V	MCGPR100V226M8X11
CAPACITOR, 47UF, 100V	MCGPR100V476M10X16
CAPACITOR, 100UF, 100V	MCGPR100V107M13X21
CAPACITOR, 220UF, 100V	MCGPR100V227M16X26
CAPACITOR, 470UF, 100V	MCGPR100V477M16X32

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