

NPCAP™-PMA Series

- Low profile and higher capacitance with the new structure.
- Super low ESR, impedance and high heat resistance have been obtained by using conductive polymer as electrolyte.
- Endurance : 105°C 5,000 hours
- Suitable for DC-DC converters, voltage regulators and decoupling applications used on computer motherboards etc.
- Non solvent resistant type
- RoHS Compliant
- Halogen Free
- Exterior resin : Flame-retardant epoxy resin(UL94 V-0)



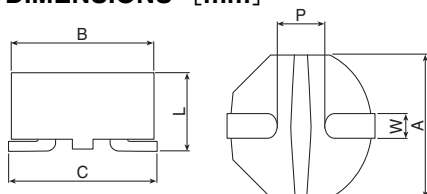
◆ SPECIFICATIONS

Items	Characteristics										
Category											
Temperature Range	-55 to +105°C										
Rated Voltage Range	16 to 25V _{dc}										
Capacitance Tolerance	±20% (M) (at 20°C , 120Hz)										
Surge Voltage	Rated voltage(V) × 1.15 (at 105°C)										
Leakage Current	Shall not exceed values shown in STANDARD RATINGS. (at 20°C after 2 minutes)										
Dissipation Factor (tan δ)	0.12 max. (at 20°C , 120Hz)										
Low Temperature Characteristics (Max. Impedance Ratio)	$Z(-25^{\circ}\text{C}) / Z(+20^{\circ}\text{C}) \leq 1.15$ $Z(-55^{\circ}\text{C}) / Z(+20^{\circ}\text{C}) \leq 1.25$ (at 100kHz)										
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 5,000 hours at 105°C . <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td>≤ ±20% of the initial value</td></tr> <tr><td>D.F. (tan δ)</td><td>≤ 200% of the initial specified value</td></tr> <tr><td>ESR</td><td>≤ 200% of the initial specified value</td></tr> <tr><td>Leakage current</td><td>≤ The initial specified value</td></tr> </table>	Appearance	No significant damage	Capacitance change	≤ ±20% of the initial value	D.F. (tan δ)	≤ 200% of the initial specified value	ESR	≤ 200% of the initial specified value	Leakage current	≤ The initial specified value
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D.F. (tan δ)	≤ 200% of the initial specified value										
ESR	≤ 200% of the initial specified value										
Leakage current	≤ The initial specified value										
Damp Heat (Steady State)	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 60°C , 90 to 95% RH without voltage applied. <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td>≤ -20 to +40% of the initial value</td></tr> <tr><td>D.F. (tan δ)</td><td>≤ 200% of the initial specified value</td></tr> <tr><td>ESR</td><td>≤ 200% of the initial specified value</td></tr> <tr><td>Leakage current</td><td>≤ The initial specified value</td></tr> </table>	Appearance	No significant damage	Capacitance change	≤ -20 to +40% of the initial value	D.F. (tan δ)	≤ 200% of the initial specified value	ESR	≤ 200% of the initial specified value	Leakage current	≤ The initial specified value
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ESR	≤ 200% of the initial specified value										
Leakage current	≤ The initial specified value										
Surge Voltage	The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor(R=1kΩ)and discharge for 5 minutes 30 seconds. <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td>≤ ±20% of the initial value</td></tr> <tr><td>D.F. (tan δ)</td><td>≤ 200% of the initial specified value</td></tr> <tr><td>ESR</td><td>≤ 200% of the initial specified value</td></tr> <tr><td>Leakage current</td><td>≤ The initial specified value</td></tr> </table>	Appearance	No significant damage	Capacitance change	≤ ±20% of the initial value	D.F. (tan δ)	≤ 200% of the initial specified value	ESR	≤ 200% of the initial specified value	Leakage current	≤ The initial specified value
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Capacitance change	≤ ±20% of the initial value										
D.F. (tan δ)	≤ 200% of the initial specified value										
ESR	≤ 200% of the initial specified value										
Leakage current	≤ The initial specified value										
Failure Rate	0.5% per 1,000 hours maximum (Confidence level 60% at 105°C)										

*Note : If any doubt arises, measure the leakage current after the following voltage treatment.

Voltage treatment : DC rated voltage is applied to the capacitors for 120 minutes at 105°C .

◆ DIMENSIONS [mm]



Size Code	A	B	C	L	W	P
F35	7.0±0.1	7.0±0.1	7.2±0.2	3.5max.	1.5±0.2	2.65±0.1

◆ MARKING

EX) 25V22μF



- Rated voltage symbol

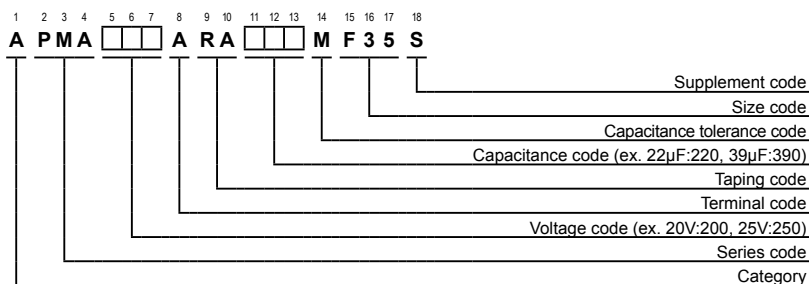
Rated voltage(V _{dc})	16	20	25
Symbol	C	D	E

- Capacitance symbol
- Capacitance code (ex. 22μF:220)

Please contact us for mass production schedule.
Specifications in this bulletin are subject to change without notice.

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◆ PART NUMBERING SYSTEM

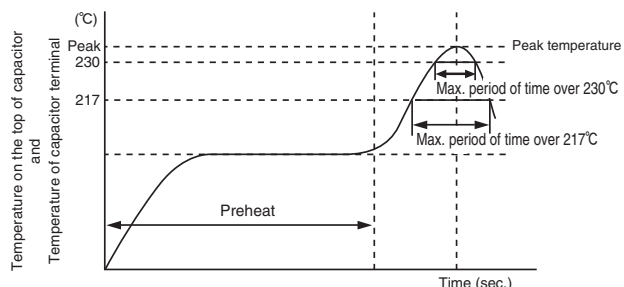


◆ STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size code	Leakage current (μA max./ after 2min.)	ESR (mΩ max./20°C , 100k to 300kHz)	Rated ripple current (mA rms/105°C , 100kHz)	Part No.
16	56	F35	448	40	2,200	APMA160ARA560MF35S
20	39	F35	390	45	2,100	APMA200ARA390MF35S
25	22	F35	275	50	2,000	APMA250ARA220MF35S
	33	F35	412	50	2,000	APMA250ARA330MF35S

◆ RECOMMENDED REFLOW SOLDERING CONDITIONS

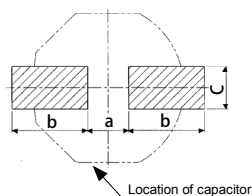
● Reflow Profile



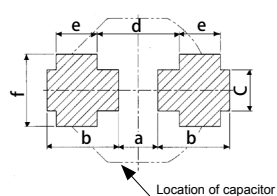
Voltage range (Vdc)	Preheat	Time maintained above 217°C	Time maintained above 230°C	Peak temp.	Reflow number
16 to 25V	150 to 180°C	50 sec. max.	40 sec. max.	250°C max.	1-cycle only
	120 sec. max.	40 sec. max.	30 sec. max.		2-cycles allowed

● Recommended Solder Land [mm]

< PMA Only >



< Share with Ta/Al multilayer capacitors (7343 size) >



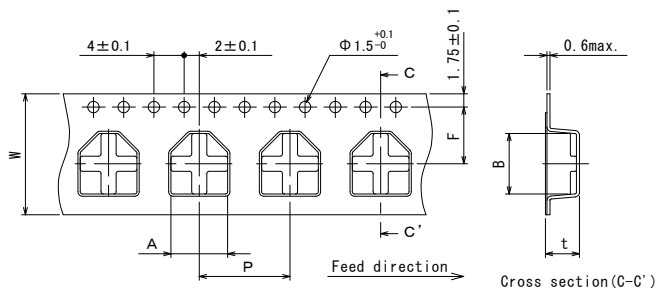
 Solder land on PC board

Size code	a	b	c	d	e	f
F35	1.9	3.5	2.0	4.0	2.0	3.0

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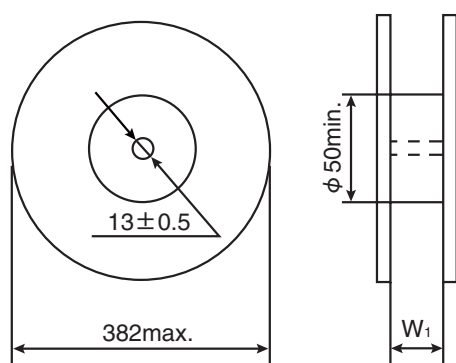
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◆ CARRIER TAPE [mm]

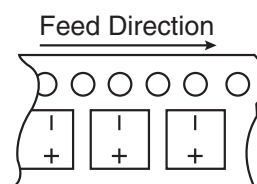


Items	W	A	B	F	P	t
Size Code	±0.3	±0.2	±0.2	±0.1	±0.1	±0.2
F35	16.0	7.5	8.0	7.5	12.0	4.4

◆ REEL DIMENSIONS [mm]



◆ POLARITY



Size Code	Quantity (pcs./reel)	Quantity (pcs./reel)	W1 (mm)
F35	1,000	7,000	18

◆ Storage

Store PMA series capacitors in a cool, dry place. Store at a temperature between 5 and 35 °C , with a humidity of 75%RH or less. PMA series capacitors are sealed in a special laminated aluminum bag. Use all capacitors once the bag is opened. Return unused capacitors to the bag, and seal it with a zipper. Please refer to the following storage conditions.

- Maximum storage term before the bag is opened : Within 2 years after manufacturing
- Maximum storage condition after the bag is opened : Within 7 days after the bag is opened