

# Plastic Film Capacitors

## Film Capacitor for AC Motor

### PMF series



#### Features

- High safety (safety function installed)
- High reliability, safety standard approval
- Small size, lightness, and low loss
- RoHS compliant

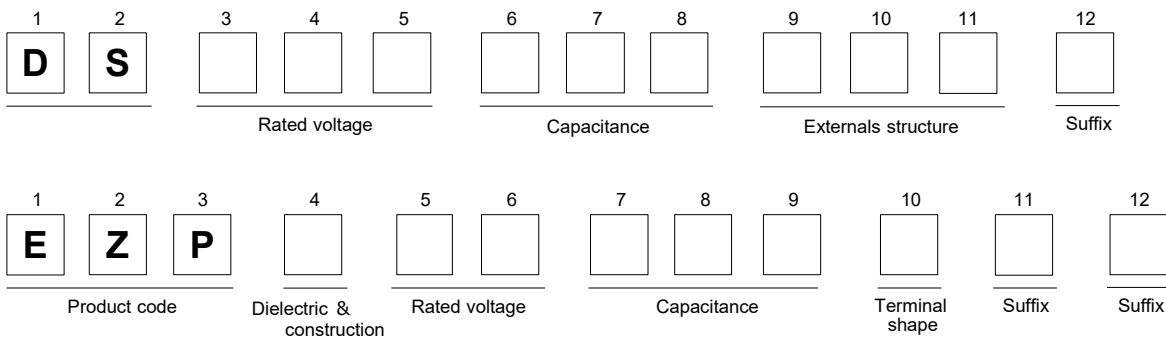
#### Recommended applications

- Motor and small compressor (for running)

#### Construction

- Internal electrode : Metallized plastic film (safety function installed)
- Plastic case : UL94 V-0
- Sealing : UL94 V-0
- Terminal : Faston terminal (tin plating), Lead wire (tin plating), Insulated wire

#### Explanation of part number



#### Applicable standard

|        |  |
|--------|--|
| Japan  | JIS C 4908 Capacitors for electrical apparatus<br>CMJ registration parts. Registration No.1475- C9902-026(JET) |
| UL/cUL | UL810/CSA C22.2 No.190 FILE No.E76560  |
| CSA    | CSA C22.2 No.190   |
| Europe | EN60252-1 AC motor Capacitors TUV  |
| China  | GB/T 3667.1 AC motor Capacitors CQC  |

#### Specifications

| Applicable standard <sup>*1</sup>           |                                | JIS UL  | EN GB                                 |
|---|--------------------------------|---|---------------------------------------|
| Safety class                                |                                | With built-in safety function<br>P2 (CMJ approval) 10000 AFC (UL) | S3                                    |
| Rated voltage (50/60 Hz) <sup>*2</sup> [AC] |                                | 150 V to 500 V<br>(For UL Approved P/N : up to 480 V.AC)          | EN / TUV : 450 V<br>GB : 250 V, 450 V |
| Rated capacitance <sup>*2</sup>             |                                | 0.5 μF to 65 μF   |                                       |
| Capacitance tolerance                       |                                | -5 % / +10 %, ±5 % (Refer to the individual drawing)              |                                       |
| Withstand voltage                           | Between terminals              | Rated voltage×1.75 60 s   | Rated voltage×2.0 60 s                |
|   | Between terminals to enclosure | (min. 2000 V [AC]) Rated voltage × 2.0 + 1000 V [AC] 60 s         |                                       |
| Maximum permissible temperature (Case wall) |                                | 70 °C (Including self temperature rising)                         |                                       |

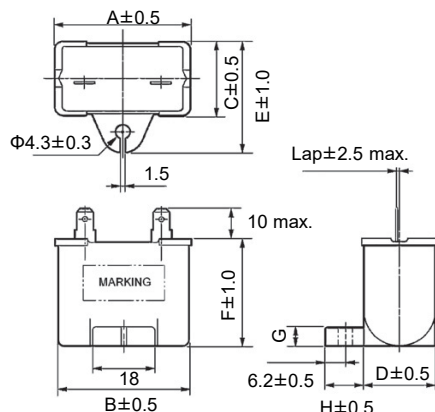
\*1 : The range of approval is different depending on each approval.

\*2 : These are typical values.

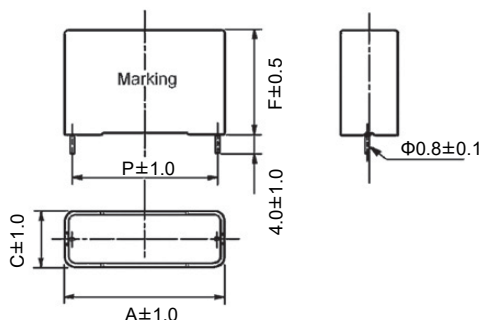
**Dimension (Example)<sup>\*3</sup>**

● Q series (Mounting type)

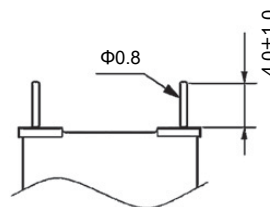
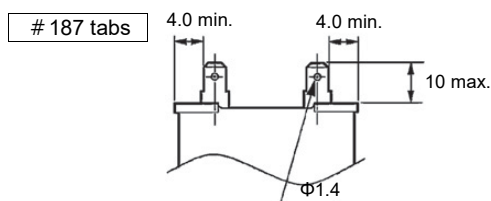
※ Non mounting type is available. (P series).



● T series (Printed circuit board (PCB))



● Terminal shape (Standard)



Unit : mm

\*3 : Other shape and specific requirement can be designed. Please contact, if necessary.

**Rating · Dimensions<sup>\*4</sup>**

● Q series (Mounting type)

| Rated voltage (V) [AC] | Capacitance (μF) | Dimensions (mm) |      |      |      |      |      |     |      | Case series |
|------------------------|------------------|-----------------|------|------|------|------|------|-----|------|-------------|
|                        |                  | A               | B    | C    | D    | E    | F    | G   | H    |             |
| 250                    | 3.0 to 4.5       | 39.5            | 38.5 | 16.2 | 14.8 | 27.0 | 27.0 | 4.0 | 11.5 | Q           |
|                        | 5.0 to 6.0       | 39.5            | 38.2 | 18.3 | 16.8 | 29.0 | 29.0 |     |      |             |
|                        | 6.5 to 9.5       | 39.5            | 38.2 | 22.0 | 20.8 | 32.5 | 32.5 |     |      |             |
|                        | 10.0 to 16.0     | 49.7            | 48.3 | 24.0 | 22.5 | 34.5 | 34.5 |     |      |             |
|                        | 16.5 to 20.0     | 50.0            | 48.5 | 26.7 | 25.3 | 37.5 | 38.0 |     |      |             |
|                        | 20.5 to 25.0     | 50.0            | 48.5 | 30.5 | 28.8 | 41.0 | 41.5 |     |      |             |
| 450                    | 25.5 to 34.5     | 50.0            | 48.5 | 34.0 | 32.6 | 45.0 | 45.0 | 6.0 | 11.5 |             |
|                        | 1.0 to 1.4       | 39.5            | 38.5 | 16.2 | 14.8 | 27.0 | 27.0 | 4.0 |      |             |
|                        | 1.5 to 1.8       | 39.5            | 38.2 | 18.3 | 16.8 | 29.0 | 29.0 |     |      |             |
|                        | 1.9 to 2.5       | 39.5            | 38.2 | 22.0 | 20.8 | 32.5 | 32.5 |     |      |             |
|                        | 3.0 to 5.0       | 49.7            | 48.3 | 24.0 | 22.5 | 34.5 | 34.5 |     |      |             |
|                        | 5.5 to 6.5       | 50.0            | 48.5 | 26.7 | 25.3 | 37.5 | 38.0 |     |      |             |
|                        | 7.0 to 8.0       | 50.0            | 48.5 | 30.5 | 28.8 | 41.0 | 41.5 |     |      |             |
|                        | 8.5 to 10.5      | 50.0            | 48.5 | 34.0 | 32.6 | 45.0 | 45.0 |     |      | 6.0         |

● T series (Printed circuit board (PCB))

| Rated voltage (V) [AC] | Capacitance (μF) | Dimensions (mm) |      |      |      | Case series |
|------------------------|------------------|-----------------|------|------|------|-------------|
|                        |                  | A               | C    | F    | P    |             |
| 250                    | 3.0 to 4.0       | 38.5            | 14.0 | 25.5 | 36.0 | T           |
|                        | 4.5 to 6.5       | 38.5            | 15.5 | 29.0 | 36.0 |             |
|                        | 7.0 to 8.0       | 38.5            | 20.5 | 29.0 | 36.0 |             |
|                        | 8.5 to 11.0      | 38.5            | 25.0 | 34.0 | 36.0 |             |
|                        | 11.5 to 18.5     | 48.5            | 22.0 | 36.0 | 46.0 |             |
| 450                    | 1.0 to 1.3       | 38.5            | 14.0 | 25.5 | 36.0 |             |
|                        | 1.4 to 2.0       | 38.5            | 15.5 | 29.0 | 36.0 |             |
|                        | 2.1 to 2.5       | 38.5            | 20.5 | 29.0 | 36.0 |             |
|                        | 3.0 to 3.5       | 38.5            | 25.0 | 34.0 | 36.0 |             |
|                        | 4.0 to 5.5       | 48.5            | 22.0 | 36.0 | 46.0 |             |

\*4 : Please contact if necessary other Voltage and Capacitance.

## Safety and Legal Matters to Be Observed

### Product specifications and applications

- Please be advised that this product and product specifications are subject to change without notice for improvement purposes. Therefore, please request and confirm the latest delivery specifications that explain the specifications in detail before the final design, or purchase or use of the product, regardless of the application. In addition, do not use this product in any way that deviates from the contents of the company's delivery specifications.
- Unless otherwise specified in this catalog or the delivery specifications, this product is intended for use in general electronic equipment (AV products, home appliances, commercial equipment, office equipment, information and communication equipment, etc.).  
When this product is used for the following special cases, please separately discuss the delivery specifications suited to each application with the company. These include applications requiring special quality and reliability, wherein their failures or malfunctions may directly threaten human life or cause harm to the human body (e.g.: space/aircraft equipment, transportation/traffic equipment, combustion equipment, medical equipment, disaster prevention/crime prevention equipment, safety equipment, etc.).

### Safety design and product evaluation

- Please ensure safety through protection circuits, redundant circuits, etc., in the customer's system design so that a defect in our company's product will not endanger human life or cause other serious damage.
- This catalog shows the quality and performance of individual parts. The durability of parts varies depending on the usage environment and conditions. Therefore, please ensure to evaluate and confirm the state of each part after it has been mounted in your product in the actual operating environment before use.  
If you have any doubts about the safety of this product, then please notify us immediately, and be sure to conduct a technical review including the above protection circuits and redundant circuits at your company.

### Laws / Regulations / Intellectual property

- The transportation of dangerous goods as designated by UN numbers, UN classifications, etc., does not apply to this product. In addition, when exporting products, product specifications, and technical information described in this catalog, please comply with the laws and regulations of the countries to which the products are exported, especially those concerning security export control.
- Each model of this product complies with the RoHS Directive (Restriction of the use of hazardous substances in electrical and electronic equipment) (2011/65/EU and (EU) 2015/863). The date of compliance with the RoHS Directive and REACH Regulation varies depending on the product model.  
Further, if you are using product models in stock and are not sure whether or not they comply with the RoHS Directive or REACH Regulation, please contact us by selecting "Sales Inquiry" from the inquiry form.
- During the manufacturing process of this product and any of its components and materials to be used, Panasonic does not intentionally use ozone-depleting substances stipulated in the Montreal Protocol and specific bromine-based flame retardants such as PBBs (Poly-Brominated Biphenyls) / PBDEs (Poly-Brominated Diphenyl Ethers). In addition, the materials used in this product are all listed as existing chemical substances based on the Act on the Regulation of Manufacture and Evaluation of Chemical Substances.
- With regard to the disposal of this product, please confirm the disposal method in each country and region where it is incorporated into your company's product and used.
- The technical information contained in this catalog is intended to show only typical operation and application circuit examples of this product. This catalog does not guarantee that such information does not infringe upon the intellectual property rights of Panasonic or any third party, nor imply that the license of such rights has been granted.

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## Matters to Be Observed When Using This Product

(Film capacitor : Automotive/Industrial)

### Response to anomalies and handling conditions

- Because the capacitor described herein is made of a combustible material, it may generate smoke or even ignite when exposed to excessive heat. We therefore recommend you cover the capacitor with a fire-resistant material or fire-resistant case.
- When a different component in the same circuit has short-circuited or developed an open failure, see to it that a voltage or current higher than the rated voltage or current or excessive heat is not applied to the capacitor.

### Reliability

A capacitor conforming to "AEC-Q200" refers to a capacitor having passed some or all of evaluation test items defined in AEC-Q200.

To know the detailed specifications of each capacitor or specific evaluation test scores, please contact us.

We issue a delivery specification sheet for each product ordered. Please confirm the delivery specification sheet when you place an order with us.

## Reference information

### Guidelines

Before using the capacitor, make sure to acquire our delivery specification sheet and confirm service conditions. If you find measurement values exceeding specified values in the specification sheet or have any question, feel free to contact us. We also advise you to refer to RCR-1001B "Safety Application Guide on Components for Use in Electronic and Electrical Equipment" and JEITA RCR-2350D "Safety Application Guide for Fixed Plastic Film Capacitors for Use in Electronic Equipment."

### Intellectual property

Panasonic Group provides customers with safe products and services. We are also making great efforts to protect our intellectual property rights for Panasonic Group products. Typical patents related to this product are as follows. (Hybrid type)

[U.S. patent]

USP Nos. 7027286, 8315031, 8861177, 9240279, 10475585

[Japanese patent]

Japanese Patent No. 4784464, 4930099, 4946618, 5391797