



# CONDUCTIVE POLYMER HYBRID ALUMINUM ELECTROLYTIC CAPACITORS

## FPV Series

- Hybrid electrolyte.
- High Ripple Current.
- -55°C ~ +125°C.
- Endurance 125°C, 4,000hrs.
- AEC-Q200 compliant : Please contact us for more details, test data, information.

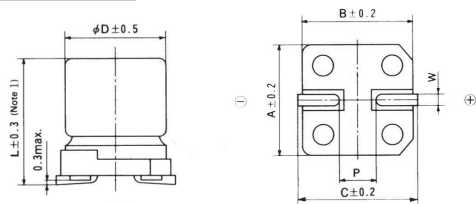


## SPECIFICATIONS

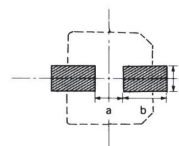
| Item                                              | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |      |      |      |      |      |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|------|------|------|------|
| Category temperature range                        | -55 to +125℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |      |      |      |      |      |
| Rated voltage range                               | 16 to 80V <sub>DC</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |      |      |      |      |      |
| Surge voltage                                     | Rated Voltage(WV)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 16                | 25   | 35   | 50   | 63   | 80   |
|                                                   | Surge Voltage(SV)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 18.4              | 29.0 | 40.0 | 57.5 | 72.5 | 92.0 |
| Capacitance tolerance                             | ±20%(M) (at 20℃, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |      |      |      |      |      |
| Tangent of loss angle                             | Shall not exceed the value in Ratings of FPV series. (at 20℃, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |      |      |      |      |      |
| Leakage Current ※ 1                               | Shall not exceed the value in Ratings of FPV series. (at 20℃, 2 minutes)                                                                                                                                                                                                                                                                                                                                                                                                                                              |                   |      |      |      |      |      |
| ESR                                               | Shall not exceed the value in Ratings of FPV series. (at 20℃, 100kHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |      |      |      |      |      |
| Impedance Ratio<br>(Characteristics at low temp.) | Impedance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Ratio             |      |      |      |      |      |
|                                                   | Z(-25℃)/Z(+20℃)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | < 1.5             |      |      |      |      |      |
|                                                   | Z(-55℃)/Z(+20℃)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | < 2.0 (at 100kHz) |      |      |      |      |      |
| Endurance                                         | The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 4,000 hours at 125℃.<br>Capacitance change ≦ ±30% of the initial value<br>Tan δ ≦ ±200% of the initial specified value<br>ESR ≦ ±200% of the initial specified value<br>Leakage current ≦ The initial specified value                                                                                                                                                                  |                   |      |      |      |      |      |
| Shelf Life                                        | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 125℃ without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements.<br>Capacitance change ≦ ±30% of the initial value<br>Tan δ ≦ ±200% of the initial specified value<br>ESR ≦ ±200% of the initial specified value<br>Leakage current ≦ The initial specified value |                   |      |      |      |      |      |
| Bias Humidity                                     | The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them to the DC rated voltage at 85℃, 85% RH for 2,000 hours.<br>Capacitance change ≦ ±30% of the initial value<br>Tan δ ≦ ±200% of the initial specified value<br>ESR ≦ ±200% of the initial specified value<br>Leakage current ≦ The initial specified value                                                                                                                                                |                   |      |      |      |      |      |

- ※ 1. If any doubt arises, measure the leakage current after following voltage treatment.(Voltage treatment:Applying rated voltage for 120minutes at 125°C)
- ※ 2. Reflow Conditions : Refer to 46page

## DIMENSIONS



## Recommended solder land on PC board



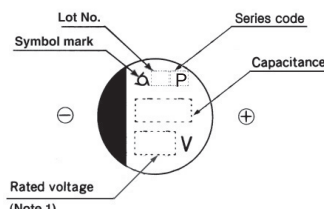
■ : Solder land on PC board

Note 1 : L±0.7 for 10×10(J10)

Unit(mm)

| Case code | φ D  | L    | A    | B    | C    | W       | P   | a   | b   | c   |
|-----------|------|------|------|------|------|---------|-----|-----|-----|-----|
| F61       | 6.3  | 5.8  | 6.6  | 6.6  | 7.2  | 0.5-0.8 | 1.9 | 1.9 | 3.5 | 1.6 |
| F80       | 6.3  | 7.7  | 6.6  | 6.6  | 7.2  | 0.5-0.8 | 1.9 | 1.9 | 3.5 | 1.6 |
| H10       | 8.0  | 10.0 | 8.3  | 8.3  | 9.0  | 0.7-1.1 | 3.1 | 3.1 | 4.2 | 2.2 |
| J10       | 10.0 | 10.0 | 10.3 | 10.3 | 11.0 | 0.7-1.1 | 4.5 | 4.5 | 4.4 | 2.2 |

## MARKING



## RATED RIPPLE CURRENT MULTIPLIERS

| Freq.(Hz) | 120  | 1k   | 5k   | 10k  | 20k  | 30k  | 100k<br>~500k |
|-----------|------|------|------|------|------|------|---------------|
| Cap.(μF)  |      |      |      |      |      |      |               |
| ~ 10      | 0.03 | 0.30 | 0.50 | 0.60 | 0.70 | 0.75 | 1.00          |
| 15 ~ 33   | 0.07 | 0.30 | 0.50 | 0.60 | 0.70 | 0.75 | 1.00          |
| 39 ~ 150  | 0.10 | 0.40 | 0.60 | 0.70 | 0.80 | 0.80 | 1.00          |
| 220 ~ 560 | 0.13 | 0.45 | 0.65 | 0.75 | 0.85 | 0.85 | 1.00          |

RATINGS OF FPV Series

| Case Code | Rated Voltage (V) | Rated Capacitance( $\mu$ F) | ESR(m $\Omega$ ) (at 100kHz) | Rated Ripple Current(mArms/ 125°C, 100kHz) | Tangent of loss angle | Leakage Current ( $\mu$ A) |
|-----------|-------------------|-----------------------------|------------------------------|--------------------------------------------|-----------------------|----------------------------|
| F61       | 16                | 82                          | 45                           | 950                                        | 0.16                  | 13                         |
|           | 25                | 47                          | 50                           | 900                                        | 0.14                  | 12                         |
|           | 25                | 56                          | 50                           | 900                                        | 0.14                  | 14                         |
|           | 35                | 27                          | 60                           | 900                                        | 0.12                  | 9                          |
|           | 35                | 47                          | 60                           | 900                                        | 0.12                  | 16                         |
|           | 50                | 10                          | 80                           | 750                                        | 0.10                  | 5                          |
|           | 50                | 22                          | 80                           | 750                                        | 0.10                  | 11                         |
|           | 63                | 6,8                         | 120                          | 700                                        | 0.08                  | 4                          |
|           | 63                | 10                          | 120                          | 700                                        | 0.08                  | 6                          |
| F80       | 16                | 150                         | 27                           | 1,450                                      | 0.16                  | 24                         |
|           | 25                | 68                          | 30                           | 1,400                                      | 0.14                  | 17                         |
|           | 25                | 100                         | 30                           | 1,400                                      | 0.14                  | 25                         |
|           | 35                | 47                          | 35                           | 1,400                                      | 0.12                  | 16                         |
|           | 35                | 68                          | 35                           | 1,400                                      | 0.12                  | 24                         |
|           | 50                | 15                          | 40                           | 1,100                                      | 0.10                  | 8                          |
|           | 50                | 33                          | 40                           | 1,100                                      | 0.10                  | 17                         |
|           | 63                | 10                          | 80                           | 900                                        | 0.08                  | 6                          |
|           | 63                | 22                          | 80                           | 900                                        | 0.08                  | 14                         |
| H10       | 16                | 270                         | 22                           | 1,700                                      | 0.16                  | 43                         |
|           | 25                | 150                         | 27                           | 1,600                                      | 0.14                  | 38                         |
|           | 25                | 220                         | 27                           | 1,600                                      | 0.14                  | 55                         |
|           | 35                | 100                         | 27                           | 1,600                                      | 0.12                  | 35                         |
|           | 35                | 150                         | 27                           | 1,600                                      | 0.12                  | 53                         |
|           | 50                | 33                          | 30                           | 1,250                                      | 0.10                  | 17                         |
|           | 50                | 47                          | 30                           | 1,250                                      | 0.10                  | 24                         |
|           | 50                | 68                          | 30                           | 1,250                                      | 0.10                  | 34                         |
|           | 63                | 22                          | 40                           | 1,100                                      | 0.08                  | 14                         |
|           | 63                | 33                          | 40                           | 1,100                                      | 0.08                  | 21                         |
|           | 63                | 47                          | 40                           | 1,100                                      | 0.08                  | 30                         |
|           | 80                | 22                          | 45                           | 1,100                                      | 0.08                  | 18                         |
| J10       | 16                | 470                         | 18                           | 2,100                                      | 0.16                  | 75                         |
|           | 25                | 270                         | 20                           | 2,000                                      | 0.14                  | 68                         |
|           | 25                | 330                         | 20                           | 2,000                                      | 0.14                  | 83                         |
|           | 35                | 150                         | 20                           | 2,000                                      | 0.12                  | 53                         |
|           | 35                | 270                         | 20                           | 2,000                                      | 0.12                  | 95                         |
|           | 50                | 56                          | 25                           | 1,600                                      | 0.10                  | 28                         |
|           | 50                | 100                         | 25                           | 1,600                                      | 0.10                  | 50                         |
|           | 50                | 120                         | 25                           | 1,600                                      | 0.10                  | 60                         |
|           | 63                | 33                          | 30                           | 1,400                                      | 0.08                  | 21                         |
|           | 63                | 56                          | 30                           | 1,400                                      | 0.08                  | 35                         |
|           | 63                | 82                          | 30                           | 1,400                                      | 0.08                  | 52                         |
|           | 80                | 39                          | 33                           | 1,400                                      | 0.08                  | 31                         |
|           | 80                | 47                          | 33                           | 1,700                                      | 0.08                  | 38                         |