

### EV SERIES ▪ STANDARD, AUTOMOTIVE 105°C TYPE

#### KEY FEATURES



AEC-Q 200



- ALUMINUM ELECTROLYTIC CAPACITOR ▪ SMD type
- Endurance: 105°C ▪ 1 000 hours
- Small dimensions
- Vibration-proof (VP) version (up to 30g) available upon request
- AEC-Q200 version available



#### SPECIFICATIONS

| Items                                              |                                                                                                                                                                                                            | Performance Characteristics                                                                                                                                   |     |    |    |      |    |    |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|----|------|----|----|
| Operating Temperature Range                        |                                                                                                                                                                                                            | -55 ~ +105°C                                                                                                                                                  |     |    |    |      |    |    |
| Rated Voltage Range                                | V <sub>R</sub>                                                                                                                                                                                             | 6.3 ~ 50V DC                                                                                                                                                  |     |    |    |      |    |    |
| Surge Voltage                                      | V <sub>S</sub>                                                                                                                                                                                             | V <sub>S</sub> = 1.15·V <sub>R</sub>                                                                                                                          |     |    |    |      |    |    |
| Capacitance Range                                  | C <sub>R</sub>                                                                                                                                                                                             | 0.1 ~ 1500μF                                                                                                                                                  |     |    |    |      |    |    |
| Cap. Tolerance                                     | ΔC                                                                                                                                                                                                         | ±20% (120Hz ▪ 20°C)                                                                                                                                           |     |    |    |      |    |    |
| Leakage Current<br>(20°C ▪ V <sub>R</sub> applied) | I <sub>LEAK</sub>                                                                                                                                                                                          | ≤ 0.01·C <sub>R</sub> ·V <sub>R</sub> or 3μA, whichever is greater ▪ After 2 minutes<br>[ I <sub>LEAK</sub> (μA) ; C <sub>R</sub> (μF) ; V <sub>R</sub> (V) ] |     |    |    |      |    |    |
| Dissipation Factor %<br>(20°C ▪ 120Hz)             | tanδ                                                                                                                                                                                                       | V <sub>R</sub> (V DC)                                                                                                                                         | 6.3 | 10 | 16 | 25   | 35 | 50 |
|                                                    |                                                                                                                                                                                                            | Ø4 to 6.3                                                                                                                                                     | 30  | 24 | 20 | 18   | 16 | 14 |
|                                                    |                                                                                                                                                                                                            | Ø8 to 10                                                                                                                                                      | 35  | 28 | 24 | 18   | 16 | 14 |
| Low Temperature<br>Characteristics at<br>120Hz     | Z ratio<br>max.                                                                                                                                                                                            | V <sub>R</sub> (V DC)                                                                                                                                         | 6.3 | 10 | 16 | 25   | 35 | 50 |
|                                                    |                                                                                                                                                                                                            | Z-25°C/Z+20°C                                                                                                                                                 | 4   | 3  | 2  | 2    | 2  | 2  |
|                                                    |                                                                                                                                                                                                            | Z-40°C/Z+20°C                                                                                                                                                 | 6   | 6  | 4  | 4    | 3  | 3  |
|                                                    |                                                                                                                                                                                                            | Z-55°C/Z+20°C                                                                                                                                                 | 8   | 8  | 6  | 4    | 3  | 3  |
| Lifetime Test                                      |                                                                                                                                                                                                            |                                                                                                                                                               |     |    |    |      |    |    |
| Endurance<br>105°C<br>(V <sub>R</sub> applied)     | Test                                                                                                                                                                                                       | 1 000 hours                                                                                                                                                   |     |    |    |      |    |    |
|                                                    | ΔC/C <sub>R</sub>                                                                                                                                                                                          | ≤ ±25% of initial measured value                                                                                                                              |     |    |    | ≤16V |    |    |
|                                                    |                                                                                                                                                                                                            | ≤ ±20% of initial measured value                                                                                                                              |     |    |    | ≥25V |    |    |
|                                                    | tanδ                                                                                                                                                                                                       | ≤ 200% of initial specified value                                                                                                                             |     |    |    |      |    |    |
|                                                    | I <sub>Leak</sub>                                                                                                                                                                                          | ≤ the initial specified value                                                                                                                                 |     |    |    |      |    |    |
| Shelf Life<br>105°C<br>(V <sub>R</sub> = 0)        | Test                                                                                                                                                                                                       | 1 000 hours                                                                                                                                                   |     |    |    |      |    |    |
|                                                    | ΔC/C <sub>R</sub>                                                                                                                                                                                          | ≤ ±25% of initial measured value                                                                                                                              |     |    |    | ≤16V |    |    |
|                                                    |                                                                                                                                                                                                            | ≤ ±20% of initial measured value                                                                                                                              |     |    |    | ≥25V |    |    |
|                                                    | tanδ                                                                                                                                                                                                       | ≤ 200% of initial specified value                                                                                                                             |     |    |    |      |    |    |
|                                                    | I <sub>Leak</sub>                                                                                                                                                                                          | ≤ the initial specified value                                                                                                                                 |     |    |    |      |    |    |
|                                                    |                                                                                                                                                                                                            | Before measurement: Restore capacitor to 20°C, apply V <sub>R</sub> for 30 min acc. JIS-C-5101-4                                                              |     |    |    |      |    |    |
| Resistance to Soldering Heat                       | The capacitors shall be kept on a hot plate maintained at 250°C for 30 seconds. After removing from the hot plate and restored at room temperature, they meet the characteristic requirements listed below |                                                                                                                                                               |     |    |    |      |    |    |
|                                                    | ΔC/C <sub>R</sub>                                                                                                                                                                                          | Within ±10% of initial value                                                                                                                                  |     |    |    |      |    |    |
|                                                    | tanδ                                                                                                                                                                                                       | Less than specified value                                                                                                                                     |     |    |    |      |    |    |
|                                                    | I <sub>Leak</sub>                                                                                                                                                                                          | Less than specified value                                                                                                                                     |     |    |    |      |    |    |

## STANDARD RATINGS

Part number shows blister tape on paper reel

| V <sub>R</sub><br>(V) | Standard | Vibration-proof | C <sub>R</sub><br>(μF) | ø D<br>(mm) | L<br>(mm) | I <sub>R</sub> • Max.<br>Ripple Current<br>+105°C • 120Hz<br>(mA rms) | CapXon Part Number  |
|-----------------------|----------|-----------------|------------------------|-------------|-----------|-----------------------------------------------------------------------|---------------------|
| 6.3                   | •        |                 | 22                     | 4           | 5.5       | 22                                                                    | EV220M6R3B055ETR □□ |
|                       | •        |                 | 33                     | 4           | 5.5       | 30                                                                    | EV330M6R3B055ETR □□ |
|                       | •        |                 | 47                     | 4           | 5.5       | 36                                                                    | EV470M6R3B055ETR □□ |
|                       | •        |                 | 100                    | 5           | 5.5       | 60                                                                    | EV101M6R3C055ETR □□ |
|                       | •        |                 | 150                    | 6.3         | 5.5       | 86                                                                    | EV151M6R3E055ETR □□ |
|                       | •        |                 | 220                    | 6.3         | 5.5       | 89                                                                    | EV221M6R3E055ETR □□ |
|                       | •        | •               | 220                    | 6.3         | 7.7       | 102                                                                   | EV221M6R3E077ETR □□ |
|                       | •        |                 | 220                    | 8           | 6.5       | 102                                                                   | EV221M6R3F065ETR □□ |
|                       | •        | •               | 330                    | 6.3         | 7.7       | 105                                                                   | EV331M6R3E077ETR □□ |
|                       | •        |                 | 330                    | 8           | 6.5       | 105                                                                   | EV331M6R3F065ETR □□ |
|                       | •        | •               | 470                    | 8           | 10.5      | 210                                                                   | EV471M6R3F105ETR □□ |
|                       | •        | •               | 1000                   | 8           | 10.5      | 202                                                                   | EV102M6R3F105ETR □□ |
|                       | •        | •               | 1000                   | 10          | 10.5      | 230                                                                   | EV102M6R3G105ETR □□ |
|                       | •        | •               | 1500                   | 10          | 10.5      | 310                                                                   | EV152M6R3G105ETR □□ |
| 10                    | •        |                 | 22                     | 4           | 5.5       | 27                                                                    | EV220M010B055ETR □□ |
|                       | •        |                 | 33                     | 4           | 5.5       | 25                                                                    | EV330M010B055ETR □□ |
|                       | •        |                 | 33                     | 5           | 5.5       | 40                                                                    | EV330M010C055ETR □□ |
|                       | •        |                 | 47                     | 5           | 5.5       | 46                                                                    | EV470M010C055ETR □□ |
|                       | •        |                 | 100                    | 5           | 5.5       | 52                                                                    | EV101M010C055ETR □□ |
|                       | •        |                 | 100                    | 6.3         | 5.5       | 60                                                                    | EV101M010E055ETR □□ |
|                       | •        |                 | 150                    | 6.3         | 5.5       | 86                                                                    | EV151M010E055ETR □□ |
|                       | •        | •               | 220                    | 6.3         | 7.7       | 105                                                                   | EV221M010E077ETR □□ |
|                       | •        |                 | 220                    | 8           | 6.5       | 105                                                                   | EV221M010F065ETR □□ |
|                       | •        | •               | 330                    | 8           | 10.5      | 195                                                                   | EV331M010F105ETR □□ |
|                       | •        | •               | 470                    | 8           | 10.5      | 210                                                                   | EV471M010F105ETR □□ |
|                       | •        | •               | 1000                   | 10          | 10.5      | 310                                                                   | EV102M010G105ETR □□ |
| 16                    | •        |                 | 10                     | 4           | 5.5       | 18                                                                    | EV100M016B055ETR □□ |
|                       | •        |                 | 22                     | 4           | 5.5       | 30                                                                    | EV220M016B055ETR □□ |
|                       | •        |                 | 33                     | 5           | 5.5       | 40                                                                    | EV330M016C055ETR □□ |
|                       | •        |                 | 47                     | 5           | 5.5       | 51                                                                    | EV470M016C055ETR □□ |
|                       | •        |                 | 100                    | 6.3         | 5.5       | 60                                                                    | EV101M016E055ETR □□ |
|                       | •        | •               | 150                    | 6.3         | 7.7       | 95                                                                    | EV151M016E077ETR □□ |
|                       | •        |                 | 150                    | 8           | 6.5       | 95                                                                    | EV151M016F065ETR □□ |
|                       | •        | •               | 220                    | 6.3         | 7.7       | 105                                                                   | EV221M016E077ETR □□ |
|                       | •        | •               | 330                    | 8           | 10.5      | 195                                                                   | EV331M016F105ETR □□ |
|                       | •        | •               | 470                    | 8           | 10.5      | 210                                                                   | EV471M016F105ETR □□ |
| 25                    | •        |                 | 4.7                    | 4           | 5.5       | 16                                                                    | EV470M025B055ETR □□ |
|                       | •        |                 | 10                     | 4           | 5.5       | 26                                                                    | EV100M025B055ETR □□ |
|                       | •        |                 | 22                     | 5           | 5.5       | 38                                                                    | EV220M025C055ETR □□ |
|                       | •        |                 | 33                     | 5           | 5.5       | 48                                                                    | EV330M025C055ETR □□ |
|                       | •        |                 | 47                     | 6.3         | 5.5       | 63                                                                    | EV470M025E055ETR □□ |
|                       | •        | •               | 100                    | 6.3         | 7.7       | 91                                                                    | EV101M025E077ETR □□ |
|                       | •        |                 | 100                    | 8           | 6.5       | 91                                                                    | EV101M025F065ETR □□ |
|                       | •        | •               | 150                    | 8           | 10.5      | 140                                                                   | EV151M025F105ETR □□ |

□□ see description at end of standard ratings

## STANDARD RATINGS

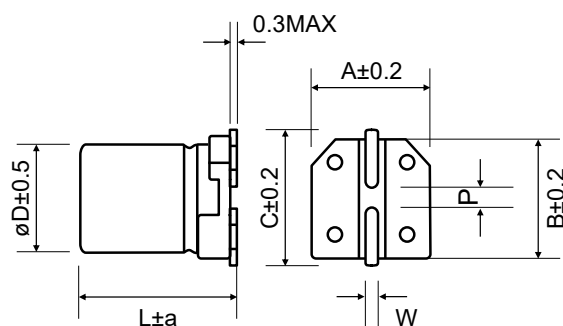
Part number shows blister tape on paper reel

| V <sub>R</sub><br>(V) | Standard | Vibration-proof | C <sub>R</sub><br>(μF) | ø D<br>(mm) | L<br>(mm) | I <sub>R</sub> • Max.<br>Ripple Current<br>+105°C • 120Hz<br>(mA rms) | CapXon Part Number  |
|-----------------------|----------|-----------------|------------------------|-------------|-----------|-----------------------------------------------------------------------|---------------------|
| 25                    | •        | •               | 220                    | 8           | 10.5      | 155                                                                   | EV221M025F105ETR □□ |
|                       | •        | •               | 330                    | 8           | 10.5      | 175                                                                   | EV331M025F105ETR □□ |
|                       | •        | •               | 330                    | 10          | 10.5      | 198                                                                   | EV331M025G105ETR □□ |
|                       | •        | •               | 470                    | 10          | 10.5      | 300                                                                   | EV471M025G105ETR □□ |
| 35                    | •        |                 | 4.7                    | 4           | 5.5       | 16                                                                    | EV4R7M035B055ETR □□ |
|                       | •        |                 | 10                     | 4           | 5.5       | 27                                                                    | EV100M035B055ETR □□ |
|                       | •        |                 | 22                     | 5           | 5.5       | 37                                                                    | EV220M035C055ETR □□ |
|                       | •        |                 | 22                     | 6.3         | 5.5       | 42                                                                    | EV220M035E055ETR □□ |
|                       | •        |                 | 33                     | 6.3         | 5.5       | 50                                                                    | EV330M035E055ETR □□ |
|                       | •        | •               | 33                     | 6.3         | 7.7       | 58                                                                    | EV330M035E077ETR □□ |
|                       | •        |                 | 47                     | 6.3         | 5.5       | 58                                                                    | EV470M035E055ETR □□ |
|                       | •        | •               | 47                     | 6.3         | 7.7       | 66                                                                    | EV470M035E077ETR □□ |
|                       | •        | •               | 100                    | 6.3         | 7.7       | 84                                                                    | EV101M035E077ETR □□ |
|                       | •        |                 | 100                    | 8           | 6.5       | 84                                                                    | EV101M035F065ETR □□ |
|                       | •        | •               | 150                    | 8           | 10.5      | 155                                                                   | EV151M035F105ETR □□ |
|                       | •        | •               | 220                    | 8           | 10.5      | 167                                                                   | EV221M035F105ETR □□ |
|                       | •        | •               | 220                    | 10          | 10.5      | 190                                                                   | EV221M035G105ETR □□ |
|                       | •        | •               | 330                    | 10          | 10.5      | 300                                                                   | EV331M035G105ETR □□ |
|                       | •        |                 | 0.1                    | 4           | 5.5       | 1                                                                     | EV0R1M050B055ETR □□ |
|                       | •        |                 | 0.22                   | 4           | 5.5       | 2.6                                                                   | EVR22M050B055ETR □□ |
|                       | •        |                 | 0.33                   | 4           | 5.5       | 3.2                                                                   | EVR33M050B055ETR □□ |
|                       | •        |                 | 0.47                   | 4           | 5.5       | 3.8                                                                   | EVR47M050B055ETR □□ |
| 50                    | •        |                 | 1                      | 4           | 5.5       | 6.3                                                                   | EV010M050B055ETR □□ |
|                       | •        |                 | 2.2                    | 4           | 5.5       | 11                                                                    | EV2R2M050B055ETR □□ |
|                       | •        |                 | 3.3                    | 4           | 5.5       | 14                                                                    | EV3R3M050B055ETR □□ |
|                       | •        |                 | 4.7                    | 4           | 5.5       | 19                                                                    | EV4R7M050B055ETR □□ |
|                       | •        |                 | 4.7                    | 5           | 5.5       | 22                                                                    | EV4R7M050C055ETR □□ |
|                       | •        |                 | 10                     | 5           | 5.5       | 29                                                                    | EV100M050C055ETR □□ |
|                       | •        |                 | 10                     | 6.3         | 5.5       | 33                                                                    | EV100M050E055ETR □□ |
|                       | •        |                 | 22                     | 6.3         | 5.5       | 51                                                                    | EV220M050E055ETR □□ |
|                       | •        | •               | 33                     | 6.3         | 7.7       | 60                                                                    | EV330M050E077ETR □□ |
|                       | •        |                 | 33                     | 8           | 6.5       | 60                                                                    | EV330M050F065ETR □□ |
|                       | •        | •               | 47                     | 6.3         | 7.7       | 66                                                                    | EV470M050E077ETR □□ |
|                       | •        |                 | 47                     | 8           | 6.5       | 66                                                                    | EV470M050F065ETR □□ |
|                       | •        | •               | 100                    | 8           | 10.5      | 140                                                                   | EV101M050F105ETR □□ |
|                       | •        | •               | 150                    | 10          | 10.5      | 180                                                                   | EV151M050G105ETR □□ |
|                       | •        | •               | 220                    | 10          | 10.5      | 220                                                                   | EV221M050G105ETR □□ |

□□: Enter **blank** for Standard package  
 □□: Enter **W** for Vibration proof version

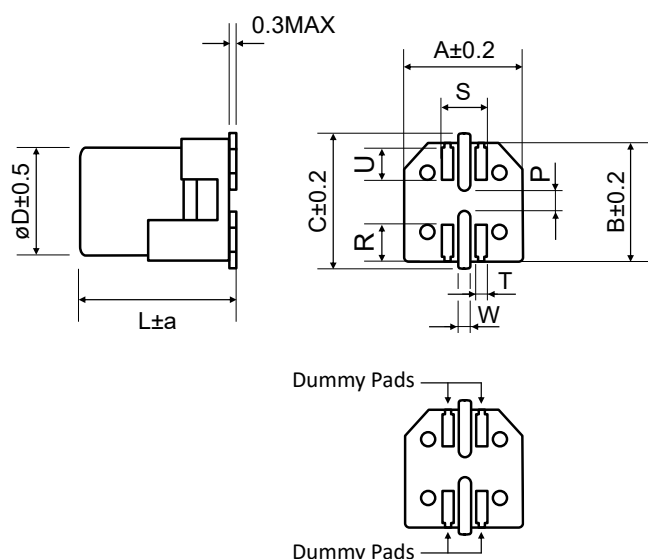
□□: Enter **X** for AEC-Q200  
 □□: Enter **XW** for AEC-Q200 and Vibration proof version

### DIMENSIONS STANDARD PACKAGE ▀ All dimensions in mm



| Ø D | L    | a   | A    | B    | C   | W          | P±0.2 |
|-----|------|-----|------|------|-----|------------|-------|
| 4   | 5.5  | Max | 4.3  | 4.3  | 4.9 | 0.5 to 0.8 | 1     |
| 5   | 5.5  | Max | 5.3  | 5.3  | 5.9 | 0.5 to 0.8 | 1.4   |
| 6.3 | 5.5  | 0.2 | 6.6  | 6.6  | 7.2 | 0.5 to 0.8 | 2.2   |
| 6.3 | 7.7  | Max | 6.6  | 6.6  | 7.2 | 0.5 to 0.8 | 2.2   |
| 8   | 6.5  | Max | 8.3  | 8.3  | 9   | 0.5 to 0.8 | 2.3   |
| 8   | 10.5 | Max | 8.3  | 8.3  | 9   | 0.7 to 1.1 | 3.1   |
| 10  | 10.5 | Max | 10.3 | 10.3 | 11  | 0.7 to 1.1 | 4.5   |

### DIMENSIONS VP PACKAGE (VIBRATION-PROOF) ▀ All dimensions in mm



| Ø D | L    | a   | A    | B    | C    | W          | P±0.2 |
|-----|------|-----|------|------|------|------------|-------|
| 6.3 | 7.7  | 0.5 | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 2.2   |
| 8   | 10.5 | 0.5 | 8.3  | 8.3  | 9    | 0.7 to 1.1 | 3.1   |
| 10  | 10.5 | 0.5 | 10.5 | 10.5 | 11.2 | 0.7 to 1.1 | 4.5   |

| Ø D | L    | R         | S         | T         | U         |
|-----|------|-----------|-----------|-----------|-----------|
| 6.3 | 7.7  | 1.23±0.05 | 3.15±0.05 | 0.76±0.03 | 1.1±0.05  |
| 8   | 10.5 | 1.96±0.05 | 4.25±0.05 | 1.1±0.03  | 1.8±0.05  |
| 10  | 10.5 | 2.35±0.05 | 4.6±0.05  | 1.1±0.03  | 1.85±0.05 |

### MULTIPLIER $K_f$ for RIPPLE CURRENT vs. FREQUENCY

| $C_R$ (µF) / Frequency (Hz) | 50/60 | 100/120 | 500 | 1k   | ≥ 10k |
|-----------------------------|-------|---------|-----|------|-------|
| $0.1 \leq C_R \leq 100$     | 0.8   | 1       | 1.2 | 1.3  | 1.5   |
| $100 < C_R \leq 1500$       | 0.8   | 1       | 1.1 | 1.15 | 1.2   |

### PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following links in the table.

|                                                      |                                       |                                         |                           |                                   |
|------------------------------------------------------|---------------------------------------|-----------------------------------------|---------------------------|-----------------------------------|
|                                                      |                                       |                                         |                           |                                   |
| <a href="#">General Precautions &amp; Guidelines</a> | <a href="#">Packaging Information</a> | <a href="#">Vibration Test Profiles</a> | <a href="#">3D Models</a> | <a href="#">Reliability Tests</a> |

### DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website [www.capxongroup.com](http://www.capxongroup.com) or contact CapXon directly.