

SMD Aluminum Electrolytic Capacitors

AEH Series



FEATURES

- Endurance: 125°C, 2000 to 5000hours
- Designed for surface mounting on high density PC board
- RoHS Compliance

APPLICATIONS

- DC/DC converters, for high density SMD boards and higher operation temperature environment applications



LEAD-FREE
LEAD-FREE COMPATIBLE
COMPONENT



RoHS
COMPLIANT

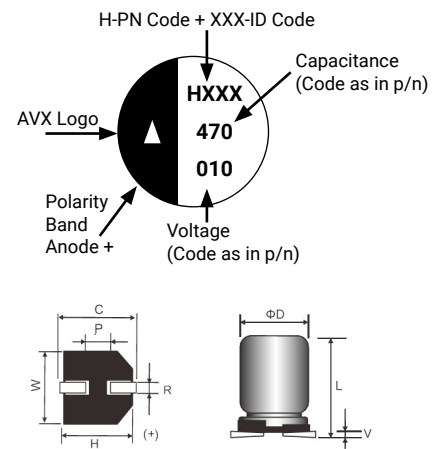
HOW TO ORDER

| | | |
|--|--|---|
| <p>Product Type Aluminum</p> <p>Series Type</p> <p>Case Size See table below</p> <p>Capacitance Code µF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)</p> <p>Tolerance M = ±20%</p> | <p>A EH 1010 470 M 010 R -</p> | <p>Special No Code = std</p> <p>Packaging R = Pure Tin 13" Reel (D_s12.50mm) 15" Reel (D_s10.00mm)</p> <p>Rated DC Voltage 010 = 10Vdc 063 = 63Vdc 016 = 16Vdc 080 = 80Vdc 025 = 25Vdc 250 = 250Vdc 035 = 35Vdc 400 = 400Vdc 050 = 50Vdc</p> |
|--|--|---|

CASE DIMENSIONS millimeters (inches)

| Code | D±0.50 (0.020) | L±0.50 (0.020) | A±0.20 (0.008) | B±0.20 (0.008) | C±0.20 (0.008) | R | P±0.30 (0.012) | V max |
|------|-------------------|-------------------|-------------------|-------------------|-------------------|----------------------------|-------------------|-----------------|
| 0608 | 6.30 (0.248) | 8.00 (0.315) | 6.60 (0.260) | 6.60 (0.260) | 7.30 (0.287) | 0.50-0.80 (0.020-0.031) | 2.00 (0.080) | 0.30 (0.012) |
| 0810 | 8.00 (0.315) | 10.50 (0.413) | 8.30 (0.327) | 8.30 (0.327) | 9.00 (0.354) | 0.70-1.10 (0.028-0.043) | 3.20 (0.126) | 0.30 (0.012) |
| 1010 | 10.00 (0.394) | 10.50 (0.413) | 10.30 (0.406) | 10.30 (0.406) | 11.00 (0.433) | 0.70-1.30 (0.028-0.051) | 4.50 (0.177) | 0.30 (0.012) |
| 1012 | 10.00 (0.394) | 12.50 (0.492) | 10.30 (0.406) | 10.30 (0.406) | 11.00 (0.433) | 0.70-1.30 (0.028-0.051) | 4.50 (0.177) | 0.30 (0.012) |
| 1013 | 10.00 (0.394) | 13.50 (0.531) | 10.30 (0.406) | 10.30 (0.406) | 11.00 (0.433) | 0.70-1.30 (0.028-0.051) | 4.50 (0.177) | 0.30 (0.012) |
| 1016 | 10.00 (0.394) | 16.50 (0.650) | 10.30 (0.406) | 10.30 (0.406) | 11.00 (0.433) | 0.70-1.30 (0.028-0.051) | 4.50 (0.177) | 0.30 (0.012) |
| 1213 | 12.50 (0.492) | 13.50 (0.531) | 13.00 (0.512) | 13.00 (0.512) | 13.70 (0.539) | 1.10-1.40 (0.043-0.055) | 4.50 (0.177) | 0.40 (0.016) |
| 1216 | 12.50 (0.492) | 16.00 (0.630) | 13.00 (0.512) | 13.00 (0.512) | 13.70 (0.539) | 1.10-1.40 (0.043-0.055) | 4.50 (0.177) | 0.40 (0.016) |

MARKING



TECHNICAL SPECIFICATIONS

| | | |
|------------------------------------|--|--|
| Category Temperature Range: | -55°C to +125°C (10-80V), -40°C to +125°C (250-400V) | |
| Capacitance Range | At 20°C, 120Hz | 2.2µF to 470µF |
| Capacitance Tolerance: | At 20°C, 120Hz | ±20% |
| Dissipation Factor (%) | Measurement Frequency: 120Hz at 20°C | Please see the ratings and part number reference table below |
| Leakage Current | Rated voltage at 20°C | 10-80V |
| | | 250-400V |
| | | 0608-1013 1213-1616 |
| | | I ≤ 0.01CV or 3µA, whichever is greater (2min) I ≤ 0.03CV or 4µA, whichever is greater (2min) I ≤ 0.04CV + 100µA (1minute) |

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AEH Series



CAPACITANCE AND RATED VOLTAGE RANGE (FIGURES DENOTES CASE SIZE)

| Capacitance | | Rated Voltage DC (V _R) | | | | | | | | |
|-------------|------|------------------------------------|------------|------|------|------|------|------|------|------|
| μF | Code | 10V | 16V | 25V | 35V | 50V | 63V | 80V | 250V | 400V |
| 2.2 | 2R2 | | | | | | | | | 0810 |
| 4.7 | 4R7 | | | | | | | | 1010 | 1010 |
| 6.8 | 6R8 | | | | | | | | | 1013 |
| 10 | 100 | | | | | | | | | 1016 |
| 22 | 220 | | | | | 0608 | | | | |
| 33 | 330 | | | | | 0608 | | | | |
| 47 | 470 | | | 0608 | 0608 | 0810 | | 1010 | | |
| 100 | 101 | 0608 | 0608, 0810 | 0810 | 0810 | 1010 | 1012 | | | |
| 220 | 221 | | | 1010 | 1010 | 1213 | | | | |
| 330 | 331 | | | 1010 | | 1216 | | | | |
| 470 | 471 | 1010 | 1012 | 1213 | 1216 | | | | | |

Released ratings

RATINGS & PART NUMBER REFERENCE

| AVX Part No. | Case Size | Capacitance (μF) | Rated Voltage (V) | DF Max. (%) | 100kHz RMS Current (mA) |
|-----------------|-----------|------------------|-------------------|-------------|-------------------------|
| 10 Volt | | | | | |
| AEH0608101M010R | 0608 | 100 | 10 | 24 | 110 |
| AEH1010471M010R | 1010 | 470 | 10 | 24 | 296 |
| 16 Volt | | | | | |
| AEH0608101M016R | 0608 | 100 | 16 | 20 | 110 |
| AEH0810101M016R | 0810 | 100 | 16 | 20 | 220 |
| AEH1012471M016R | 1012 | 470 | 16 | 20 | 340 |
| 25 Volt | | | | | |
| AEH0608470M025R | 0608 | 47 | 25 | 16 | 110 |
| AEH0810101M025R | 0810 | 100 | 25 | 16 | 220 |
| AEH1010221M025R | 1010 | 220 | 25 | 16 | 296 |
| AEH1010331M025R | 1010 | 330 | 25 | 16 | 296 |
| AEH1213471M025R | 1213 | 470 | 25 | 16 | 750 |
| 35 Volt | | | | | |
| AEH0608470M035R | 0608 | 47 | 35 | 14 | 110 |
| AEH0810101M035R | 0810 | 100 | 35 | 14 | 220 |
| AEH1010221M035R | 1010 | 220 | 35 | 14 | 296 |
| AEH1216471M035R | 1216 | 470 | 35 | 14 | 900 |
| 50 Volt | | | | | |
| AEH0608220M050R | 0608 | 22 | 50 | 14 | 83 |
| AEH0608330M050R | 0608 | 33 | 50 | 14 | 83 |
| AEH0810470M050R | 0810 | 47 | 50 | 14 | 160 |
| AEH1010101M050R | 1010 | 100 | 50 | 14 | 247 |
| AEH1213221M050R | 1213 | 220 | 50 | 14 | 550 |
| AEH1216331M050R | 1216 | 330 | 50 | 14 | 700 |
| 63 Volt | | | | | |
| AEH1012101M063R | 1012 | 100 | 63 | 12 | 270 |
| 80 Volt | | | | | |
| AEH1010470M080R | 1010 | 47 | 80 | 12 | 245 |
| 250 Volt | | | | | |
| AEH10104R7M250R | 1010 | 4.7 | 250 | 24 | 59 |
| 400 Volt | | | | | |
| AEH08102R2M400R | 0810 | 2.2 | 400 | 30 | 30 |
| AEH10104R7M400R | 1010 | 4.7 | 400 | 30 | 65 |
| AEH10136R8M400R | 1013 | 6.8 | 400 | 30 | 90 |
| AEH1016100M400R | 1016 | 10 | 400 | 30 | 102 |

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5RMS with DC bias of 2.2 volts. DCL is measured at rated voltage after 5 minutes.



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.avx.com/disclaimer/ by reference and should be reviewed in full before placing any order.

SMD Aluminum Electrolytic Capacitors

AEH Series

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

| Rated Voltage (Vdc) | Capacitance (μF) | 120 - 1K (Hz) | 1K - 10K (Hz) | 10K - 100K (Hz) | 100K(Hz) |
|---------------------|------------------|---------------|---------------|-----------------|----------|
| 10-80 | Cap.<220 | 0.4 | 0.75 | 0.9 | 1 |
| | 220≤Cap.< 470 | 0.5 | 0.85 | 0.94 | 1 |
| 250-400 | Cap.≤33 | 0.55 | 0.83 | 0.97 | 1 |
| | Cap.>33 | 0.66 | 0.86 | 0.93 | 1 |

Internal heating produced by ripple current will reduce the lifetime of capacitors, at a rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use the rms ripple current should be minimized.

QUALIFICATION TABLE

| Test | AEH series | | | | | | | | | | | | | | | | | | | |
|---|--|-------------------|-------------------|---------------------------------------|---|---|---|---|---|---|----|----|----|----|----|----|----|-----|-----|--|
| | Condition | Characteristics | | | | | | | | | | | | | | | | | | |
| Low Temperature Characteristics (Max. Impedance Ratio) | At 120Hz | Rated Voltage (V) | | | | | | | | | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 250 | 400 | |
| | | 0608-1016 | Z(-25°C)/Z(+20°C) | | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 6 | 6 | | | | | |
| | | | Z(-40°C)/Z(+20°C) | | 6 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 10 | 18 | | | | | | |
| | | 1213-1216 | Z(-25°C)/Z(+20°C) | | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 6 | 6 | | | | | | |
| | | | Z(-40°C)/Z(+20°C) | | 8 | 6 | 4 | 3 | 3 | 3 | 3 | 3 | 10 | 18 | | | | | | |
| Endurance | The specifications shall be met when the capacitors are restored to 20°C after rated voltage is applied for a specified period of time at 125°C. Load life: 0608(10-50V) 1000hours 0810-1016(10-80V) 2000hours 1213-1216(10-80V) 5000hours 0810-1216(250-400V) 3000hours | ΔC/C | | ≤ ±30% of the initial limit | | | | | | | | | | | | | | | | |
| | | DF | | ≤ 300% of the initial specified limit | | | | | | | | | | | | | | | | |
| | | DCL | | ≤ Initial specified limit | | | | | | | | | | | | | | | | |
| Shelf Life | The following specifications shall be satisfied when the capacitors are restored to 20°C after leaving them under no load at 125°C for 1,000 hours (400V: 500 hours). | ΔC/C | | ≤ ±30% of the initial limit | | | | | | | | | | | | | | | | |
| | | DF | | ≤ 300% of the initial specified limit | | | | | | | | | | | | | | | | |
| | | DCL | | ≤ 500% of the initial specified limit | | | | | | | | | | | | | | | | |

STORAGE

1. It is recommended to keep capacitors between the ambient temperatures of 5°C to 35°C and a relative humidity of 75%.

- (A) Storage life: ≤ 12 months
- (B) Expiry date: calculating from the date marked on the sleeve
- (C) Please keep capacitors in the original package
- (D) Avoid storing the capacitors under such circumstances
 - with water and oil or damp & dewing location
 - with gas and oil
 - with toxic gases such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, bromine and methane
 - with direct sunlight, ozone, ultraviolet rays or radiation

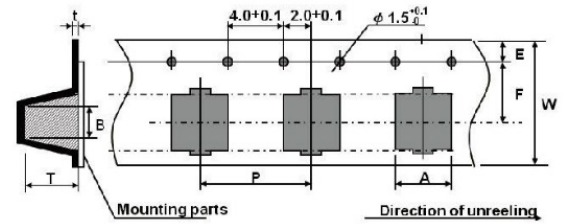
2. Leakage current tends to increase when capacitors have been stored for long period of time. The higher storage Temp. Rise, the higher leakage current increase. Please take caution when selecting the storage location. The leakage current will decrease gradually as voltage is applied to the capacitor. The capacitor is subjected to aging before using where increased leakage may cause problems in the circuit.

SMD Aluminum Electrolytic Capacitors

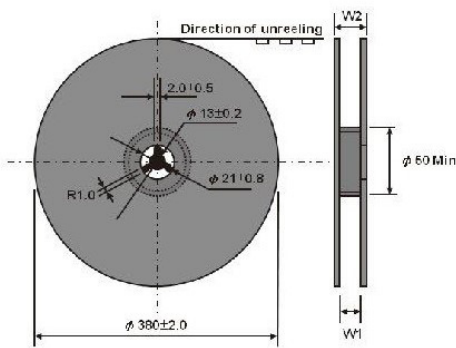
AEH Series

PACKAGE TAPE DIMENSIONS units (mm)

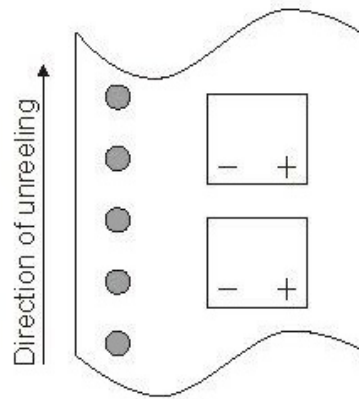
| Size Code | A±0.20 | B±0.20 | W±0.30 | F±0.10 | E±0.10 | P±0.10 | t±0.10 | T±0.20 |
|-----------|--------|--------|--------|--------|--------|--------|--------|-----------|
| 0608 | 7.0 | 7.0 | 16.0 | 7.5 | 1.75 | 12.0 | 0.4 | 8.0 |
| 0810 | 8.7 | 8.7 | 24.0 | 11.5 | 1.75 | 16.0 | 0.4 | 11.0 |
| 1010 | 10.7 | 10.7 | 24.0 | 11.5 | 1.75 | 16.0 | 0.4 | 11.0 |
| 1012 | 10.7 | 10.7 | 24.0 | 11.5 | 1.75 | 16.0 | 0.4 | 13.0-13.5 |
| 1013 | 10.7 | 10.7 | 24.0 | 11.5 | 1.75 | 16.0 | 0.4 | 15.0 |
| 1016 | 10.7 | 10.7 | 24.0 | 11.5 | 1.75 | 16.0 | 0.4 | 17.5 |
| 1213 | 13.4 | 13.4 | 32.0 | 14.2 | 1.75 | 24.0 | 0.4 | 14.5 |
| 1216 | 13.4 | 13.4 | 32.0 | 14.2 | 1.75 | 24.0 | 0.4 | 16.5 |



REEL



POLARITY



DIMENSIONS units (mm)

| Size Code | W1±1.00 | W2±1.00 | Qty./Reel |
|-----------|---------|---------|-----------|
| 0608 | 18.0 | 22.0 | 1000 |
| 0810 | 18.0 | 22.0 | 550 |
| 1010 | 26.0 | 31.0 | 550 |
| 1012 | 26.0 | 31.0 | 500 |
| 1013 | 26.0 | 31.0 | 450 |
| 1016 | 26.0 | 31.0 | 350 |
| 1213 | 34.0 | 39.0 | 200 |
| 1216 | 34.0 | 39.0 | 150 |

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