

SMD Aluminum Hybrid Electrolytic Capacitors

AHA Series



FEATURES

- Low ESR
- High Voltage, Long Life
- 105°C, 5000 to 10,000 hours
- RoHS compliant

APPLICATIONS

- Industrial Equipment
- Base Station Equipment, etc.

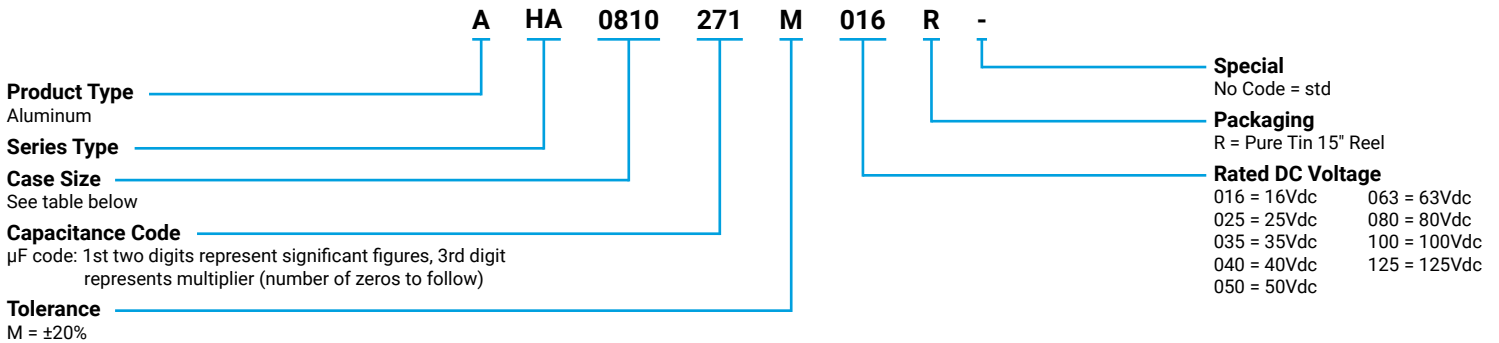


LEAD-FREE
LEAD-FREE COMPATIBLE
COMPONENT



RoHS
COMPLIANT

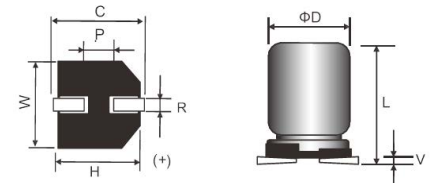
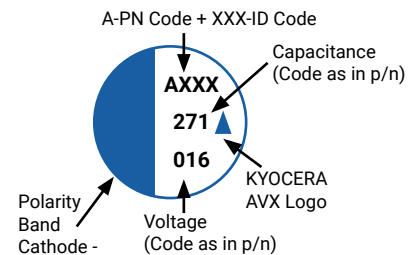
HOW TO ORDER



CASE DIMENSIONS millimeters (inches)

| Code | D±0.50 (0.020) | L±0.50 (0.020) | W±0.20 (0.008) | H±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) |

MARKING



TECHNICAL SPECIFICATIONS

| | | |
|------------------------------------|---|--|
| Category Temperature Range: | -55°C to + 105°C | |
| Capacitance Range: | At 25°C, 120Hz | 10µF to 560µF |
| Capacitance Tolerance: | At 25°C, 120Hz | ±20% |
| Dissipation Factor (%) | Measurement Frequency: 120Hz at 25°C | Please see the ratings and part number reference table below |
| Leakage Current: | After 2 minutes at rated working voltage at 25°C* | $I \leq 0.01CV$ or 3µA, whichever is greater |

* Note: In the case of an anomalous reading, re-measure the leakage current after following voltage treatment:
Voltage treatment: DC rated voltage to be applied to the capacitors for 120 minutes at 105°C.

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CAPACITANCE AND RATED VOLTAGE RANGE (FIGURES DENOTES CASE SIZE)

| Capacitance | | Rated Voltage DC (V _R) | | | | | | | | |
|-------------|------|------------------------------------|------|------|------|------|------------|------|------|------|
| μF | Code | 16V | 25V | 35V | 40V | 50V | 63V | 80V | 100V | 125V |
| 10 | 100 | | | | | | 0608 | | 1010 | 1010 |
| 12 | 120 | | | | | | | 1010 | 1010 | |
| 15 | 150 | | | | | 0608 | | 1010 | 1012 | |
| 18 | 180 | | | | | | | 1012 | | |
| 22 | 220 | | | | | | 0810 | | | |
| 27 | 270 | | 0608 | | 0608 | | | | | |
| 33 | 330 | | | | | 0810 | 0810, 1010 | | | |
| 39 | 390 | | | | | | | 1010 | | |
| 47 | 470 | | | 0608 | | | 1010 | | | |
| 56 | 560 | | | | 0810 | 1010 | 1012 | | | |
| 68 | 680 | | 0608 | | | | | | | |
| 82 | 820 | | | | | 1012 | | | | |
| 100 | 101 | | | 0810 | 1010 | | | | | |
| 120 | 121 | 0608 | | | 1012 | | | | | |
| 150 | 151 | | 0810 | 1010 | | | | | | |
| 220 | 221 | | | 1012 | | | | | | |
| 270 | 271 | 0810 | 1010 | | | | | | | |
| 330 | 331 | | 1012 | | | | | | | |
| 470 | 471 | 1010 | | | | | | | | |
| 560 | 561 | 1012 | | | | | | | | |

Released ratings

RATINGS & PART NUMBER REFERENCE

| Part No. | Case Size | Capacitance (μF) | Rated Voltage (V) | DCL Max. (μA) | DF Max. (%) | ESR Max. @ 100kHz (mΩ) | 100kHz RMS Current (mA)/105°C |
|-----------------|-----------|------------------|-------------------|---------------|-------------|------------------------|-------------------------------|
| 16 Volt | | | | | | | |
| AHA0608121M016R | 0608 | 120 | 16 | 19 | 16 | 40 | 1500 |
| AHA0810271M016R | 0810 | 270 | 16 | 43 | 16 | 26 | 2000 |
| AHA1010471M016R | 1010 | 470 | 16 | 75 | 16 | 21 | 2600 |
| AHA1012561M016R | 1012 | 560 | 16 | 90 | 16 | 15 | 3000 |
| 25 Volt | | | | | | | |
| AHA0608270M025R | 0608 | 27 | 25 | 7 | 16 | 70 | 1200 |
| AHA0608680M025R | 0608 | 68 | 25 | 17 | 16 | 45 | 1400 |
| AHA0810151M025R | 0810 | 150 | 25 | 38 | 16 | 27 | 1900 |
| AHA1010271M025R | 1010 | 270 | 25 | 68 | 16 | 22 | 2500 |
| AHA1012331M025R | 1012 | 330 | 25 | 83 | 16 | 16 | 2900 |
| 35 Volt | | | | | | | |
| AHA0608470M035R | 0608 | 47 | 35 | 16 | 16 | 60 | 1300 |
| AHA0810101M035R | 0810 | 100 | 35 | 35 | 16 | 30 | 1800 |
| AHA1010151M035R | 1010 | 150 | 35 | 53 | 16 | 23 | 2400 |
| AHA1012221M035R | 1012 | 220 | 35 | 77 | 16 | 17 | 2800 |
| 40 Volt | | | | | | | |
| AHA0608270M040R | 0608 | 27 | 40 | 11 | 16 | 70 | 1200 |
| AHA0810560M040R | 0810 | 56 | 40 | 22 | 16 | 32 | 1700 |
| AHA1010101M040R | 1010 | 100 | 40 | 40 | 16 | 24 | 2400 |
| AHA1012121M040R | 1012 | 120 | 40 | 48 | 16 | 18 | 2700 |
| 50 Volt | | | | | | | |
| AHA0608150M050R | 0608 | 15 | 50 | 8 | 16 | 80 | 1200 |
| AHA0810330M050R | 0810 | 33 | 50 | 17 | 16 | 35 | 1600 |
| AHA1010560M050R | 1010 | 56 | 50 | 28 | 16 | 25 | 2300 |
| AHA1012820M050R | 1012 | 82 | 50 | 41 | 16 | 19 | 2600 |

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.

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RATINGS & PART NUMBER REFERENCE

| Part No. | Case Size | Capacitance (μF) | Rated Voltage (V) | DCL Max. (μA) | DF Max. (%) | ESR Max. @ 100kHz (mΩ) | 100kHz RMS Current (mA)/105°C |
|-----------------|-----------|------------------|-------------------|---------------|-------------|------------------------|-------------------------------|
| 63 Volt | | | | | | | |
| AHA0608100M063R | 0608 | 10 | 63 | 6 | 16 | 100 | 1000 |
| AHA0810220M063R | 0810 | 22 | 63 | 14 | 16 | 40 | 1500 |
| AHA0810330M063R | 0810 | 33 | 63 | 21 | 16 | 40 | 1500 |
| AHA1010330M063R | 1010 | 33 | 63 | 21 | 16 | 30 | 2100 |
| AHA1010470M063R | 1010 | 47 | 63 | 30 | 16 | 30 | 2100 |
| AHA1012560M063R | 1012 | 56 | 63 | 35 | 16 | 22 | 2400 |
| 80 Volt | | | | | | | |
| AHA1010120M080R | 1010 | 12 | 80 | 10 | 16 | 70 | 1600 |
| AHA1010150M080R | 1010 | 15 | 80 | 12 | 16 | 70 | 1600 |
| AHA1012180M080R | 1012 | 18 | 80 | 14 | 16 | 50 | 1800 |
| AHA1010390M080R | 1010 | 39 | 80 | 31 | 16 | 70 | 1600 |
| 100 Volt | | | | | | | |
| AHA1010100M100R | 1010 | 10 | 100 | 10 | 16 | 80 | 1400 |
| AHA1010120M100R | 1010 | 12 | 100 | 12 | 16 | 80 | 1400 |
| AHA1012150M100R | 1012 | 15 | 100 | 15 | 16 | 80 | 1600 |
| 125 Volt | | | | | | | |
| AHA1010100M125R | 1010 | 10 | 125 | 13 | 16 | 90 | 1200 |

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.

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

| Capacitance Range | 100Hz ≤ F(Hz) < 1K | 1K ≤ F(Hz) < 10K | 10K ≤ F(Hz) < 100K | 100K(Hz) ≤ F |
|-------------------|--------------------|------------------|--------------------|--------------|
| 4.7 < C ≤ 33 | 0.05 | 0.32 | 0.67 | 1.00 |
| 33 < C | 0.10 | 0.35 | 0.70 | 1.00 |

QUALIFICATION TABLE

| Test | AHA series (Temperature range -55°C to +105°C) | | |
|--------------------------|--|--------------------|---------------------------------------|
| | Condition | Characteristics | |
| Endurance | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 5000 to 10,000 hours at 105°C. Φ6.3 = 5000hrs, D≥ Φ8 = 10,000hrs | Visual examination | no visible damage |
| | | ΔC/C | ≦ ±30% of the initial limit |
| | | DF | ≦ 200% of the initial specified limit |
| | | ESR | ≦ 200% of the initial specified limit |
| | | DCL | ≦ Initial specified limit or less |
| Damp Heat (Steady State) | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjection them to store at 60°C, 90 to 95% RH for 1000 hours, without DC applied. | Visual examination | no visible damage |
| | | ΔC/C | ≦ ±30% of the initial limit |
| | | DF | ≦ 200% of the initial specified limit |
| | | ESR | ≦ 200% of the initial specified limit |
| | | DCL | ≦ Initial specified limit or less |
| Surge Voltage | The capacitors shall be subjected to 1000 cycles each consisting of charge with the surge voltages specified at 15-35°C for 30 seconds. Through a protective resistor (R = 1kΩ) and discharge for 5 minutes 30 seconds. | Visual examination | no visible damage |
| | | ΔC/C | ≦ ±30% of the initial limit |
| | | DF | ≦ 200% of the initial specified limit |
| | | ESR | ≦ 200% of the initial specified limit |
| | | DCL | ≦ Initial specified limit or less |

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REFLOW

| Voltage Range (V) | 16 - 63 | 80 - 125 |
|-----------------------------|----------------------|--------------------|
| Peak Temperature | 260°C, 5 sec. max. | 250°C, 5 sec. max. |
| Preheat Temperature | 120°C, 120 sec. max. | |
| Duration at 200°C or higher | 100 sec. max. | 100 sec. max. |
| Duration at 220°C or higher | 80 sec. max. | 80 sec. max. |
| Duration at 230°C or higher | 40 sec. max. | 40 sec. max. |
| Reflow Number | Twice or less | Twice or less |

STORAGE

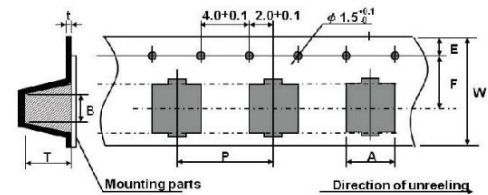
- It is recommended to keep capacitors between the ambient temperatures of 5°C to 35°C and a relative humidity of 75% or below.
- Confirm that the environment does not have any of the following conditions:
 - Damp conditions such as water, saltwater spray, or oil spray or fumes. High humidity or humidity condensation situations.
 - In an atmosphere filled with toxic gasses (such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, ammonia, etc.).
 - Being exposed to direct sunlight, ozone, ultraviolet ray, or radiation.
 - Being exposed to acidic or alkaline solutions.
 - Under severe conditions where vibration and / or mechanical shock exceed the applicable ranges of the specification.

| Category | Description | Storage Life |
|------------------|----------------|---|
| Mid-High Voltage | 160V and above | 2yrs, after 1yr, needs to check characteristics, if NG, needs to do aging |
| Low Voltage | 120V and below | 2yrs |

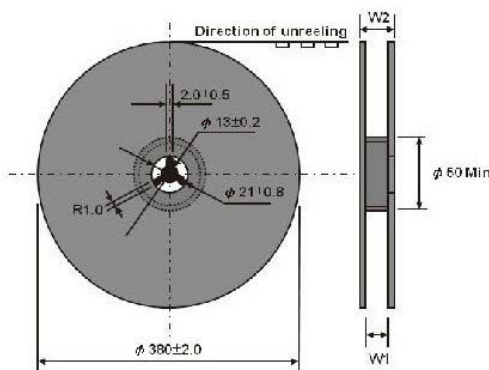
Remark: Re-aging condition depends on its own spec.

PACKAGE TAPE DIMENSIONS units (mm)

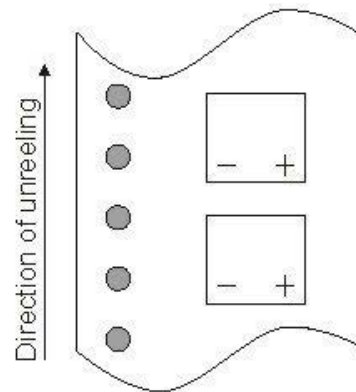
| Size Code | A±0.20 | B±0.20 | W±0.30 | F±0.10 | E±0.10 | P±0.10 | t±0.10 | T±0.20 |
|-----------|--------|--------|--------|--------|--------|--------|--------|-------------|
| 0608 | 7.0 | 7.0 | 16.0 | 7.5 | 1.75 | 12.0 | 0.4 | 8.0 |
| 0810 | 8.7 | 8.7 | 24.0 | 11.5 | 1.75 | 16.0 | 0.4 | 11.0 |
| 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 |



REEL



POLARITY



DIMENSIONS units (mm)

| Size Code | W1±1.00 | W2±1.00 | Qty./Reel |
|-----------|---------|---------|-----------|
| 0608 | 18.0 | 22.0 | 1000 |
| 0810 | 26.0 | 31.0 | 500 |
| 1010 | 26.0 | 31.0 | 500 |
| 1012 | 26.0 | 31.0 | 400 |

RECOMMENDED LAND PATTERN DIMENSION OF PCB

| Size Code | A (mm) | B (mm) | C (mm) |
|-----------|--------|--------|--------|
| 0608 | 1.9 | 3.5 | 1.6 |
| 0810 | 3.0 | 3.5 | 2.5 |
| 1010 | 4.0 | 4.0 | 2.5 |
| 1012 | 4.0 | 4.0 | 2.5 |

