

SINLOON®

AEC-Q200 大功率低阻值貼片電阻

AQHP Series

Resistance Range: 10m - 990m Ω

AEC-Q200 High Power Chip Resistor

□ FEATURE

- ◆ AEC-Q200 rev. D compliant
- ◆ RoHS compliant version available
- ◆ Leadless surface mount construction
- ◆ Reliability high quality and fast delivery
- ◆ Reduction of assembly costs matching with placement machines
- ◆ Tolerance: ±1% , ±5%; Rated power 2W - 2512.

□ Application

- ◆ Automotive electronic
- ◆ Appliance: Air conditioner, Refrigerator
- ◆ Entertainment: Stereo, TV tuners, Tape recorder.
- ◆ Indoor lighting, Central door locking, Wiper module
- ◆ Communication equipment: Cell phone, Fax machine
- ◆ Power equipment: Power supply, illumination equipment.
- ◆ Measuring instrument: Electric meter, Navigation equipment.

□ Ordering Information

Example: AQHP03FVR005

| Power | Size | Type   | Tolerance | TCR/°C    | Resistance (IEC-63) |         | Package |
|-------|------|--------|-----------|-----------|---------------------|---------|---------|
|       |      |        |           |           | E24                 | E96     |         |
| 1/8W  | 0603 | AQHP03 | B = ±0.1% | G = ±300  | m5=R0005            | 5K Reel |         |
| 1/4W  | 0805 | AQHP05 | D = ±0.5% | H = ±400  | 5m=R005             | 5K Reel |         |
| 1/2W  | 1206 | AQHP06 | F = ±1%   | I = ±500  | 10m=R010            | 5K Reel |         |
| 4/6W  | 1210 | AQHP10 | G = ±2%   | J = ±600  | 100m=R100           | 5K Reel |         |
| 1W    | 1812 | AQHP12 | J = ±5%   | U = ±700  | 1000m=1R0           | 5K Reel |         |
| 1W    | 2010 | AQHP20 | K = ±10%  | V = ±800  |                     | 5K Reel |         |
| 2W    | 2512 | AQHP25 |           | Y = ±1000 |                     | 4K Reel |         |

□ Dimension

Unit: mm

| Power | Size | Type   | L          | W          | H          | D1        | D2        | Figure |
|-------|------|--------|------------|------------|------------|-----------|-----------|--------|
| 1/8W  | 0603 | AQHP03 | 1.6±0.15   | 0.80±0.10  | 0.45±0.10  | 0.30±0.20 | 0.30±0.20 | Fig-1  |
| 1/4W  | 0805 | AQHP05 | 2.0±0.15   | 1.25±0.10  | 0.50±0.10  | 0.35±0.20 | 0.40±0.20 | Fig-1  |
| 1/2W  | 1206 | AQHP06 | 3.1±0.10   | 1.55±0.10  | 0.55±0.10  | 0.45±0.20 | 0.40±0.20 | Fig-1  |
| 4/6W  | 1210 | AQHP10 | 3.1±0.10   | 2.55±0.10  | 0.55±0.10  | 0.50±0.20 | 0.50±0.20 | Fig-1  |
| 1W    | 1812 | AQHP12 | 4.50 ±0.20 | 3.00 ±0.20 | 0.55 ±0.10 | 0.45±0.20 | 0.40±0.20 | Fig-1  |
| 1W    | 2010 | AQHP20 | 5.0±0.20   | 2.50±0.20  | 0.55±0.10  | 0.60±0.20 | 0.50±0.20 | Fig-1  |
| 2W    | 2512 | AQHP25 | 3.1±0.10   | 4.60±0.20  | 0.55±0.10  | 0.45±0.20 | 0.40±0.20 | Fig-1  |

Fig-1

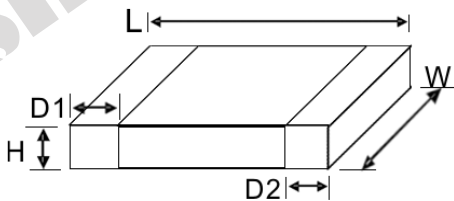


Fig-2

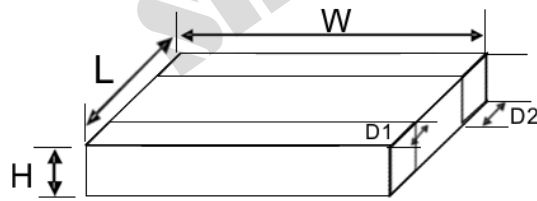
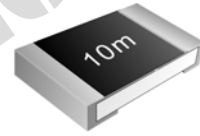
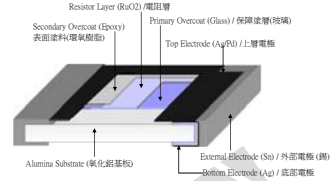


Figure:



Construction



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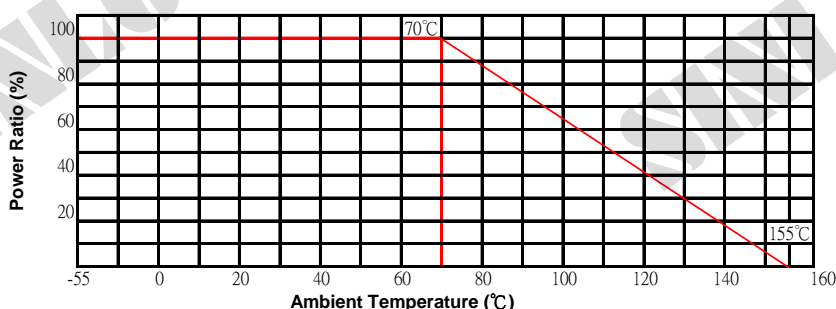
Resistance Range: 10m - 990m Ω

AEC-Q200 High Power Chip Resistor

□ Standard General Electrical Specification

| Rated at 70°C                | Case | Type   | Rated Voltage(V) | Max. Voltage |          | Resistance Range (mΩ) | Tolerance | T.C.R (ppm/°C) |
|------------------------------|------|--------|------------------|--------------|----------|-----------------------|-----------|----------------|
|                              |      |        |                  | Working      | Overload |                       |           |                |
| 1/8W                         | 0603 | AQHP03 | 0.1-0.31         | 0.31V        | 0.775V   | 100~330               | ±1%;±5%   | ±800           |
|                              |      |        |                  |              |          | 331~510               |           | ±600           |
|                              |      |        |                  |              |          | 511~990               |           | ±400           |
| 1/4W                         | 0805 | AQHP05 | 0.04-0.35        | 0.35V        | 0.875V   | 10~50                 | ±1%;±5%   | ±1000          |
|                              |      |        |                  |              |          | 51~100                |           | ±800           |
|                              |      |        |                  |              |          | 101~330               |           | ±600           |
|                              |      |        |                  |              |          | 331~990               |           | ±400           |
| 1/2W                         | 1206 | AQHP06 | 0.05-0.5         | 0.5V         | 1.25V    | 10~50                 | ±1%;±5%   | ±800           |
|                              |      |        |                  |              |          | 51~100                |           | ±600           |
|                              |      |        |                  |              |          | 101~330               |           | ±500           |
|                              |      |        |                  |              |          | 331~990               |           | ±400           |
| 4/6W                         | 1210 | AQHP10 | 0.06-0.57        | 0.57V        | 1.425V   | 10~50                 | ±1%;±5%   | ±800           |
|                              |      |        |                  |              |          | 51~100                |           | ±600           |
|                              |      |        |                  |              |          | 101~330               |           | ±500           |
|                              |      |        |                  |              |          | 331~990               |           | ±400           |
| 1W                           | 1812 | AQHP12 | 0.07-0.7         | 0.7V         | 1.75V    | 10~50                 | ±1%;±5%   | ±800           |
|                              |      |        |                  |              |          | 51~100                |           | ±600           |
|                              |      |        |                  |              |          | 101~330               |           | ±500           |
|                              |      |        |                  |              |          | 331~990               |           | ±400           |
| 1W                           | 2010 | AQHP20 | 0.07-0.7         | 0.7V         | 1.75V    | 10~50                 | ±1%;±5%   | ±800           |
|                              |      |        |                  |              |          | 51~100                |           | ±600           |
|                              |      |        |                  |              |          | 101~330               |           | ±500           |
|                              |      |        |                  |              |          | 331~990               |           | ±400           |
| 2W                           | 2512 | AQHP25 | 0.1-0.99         | 0.99V        | 2.475V   | 10~50                 | ±1%;±5%   | ±800           |
|                              |      |        |                  |              |          | 51~100                |           | ±600           |
|                              |      |        |                  |              |          | 101~330               |           | ±500           |
|                              |      |        |                  |              |          | 331~990               |           | ±400           |
| Jumper Resistance Value:     |      |        | 50m Ω Maximum    |              |          |                       |           |                |
| Operating Temperature Range: |      |        | -55°C ~ +155°C   |              |          |                       |           |                |

◆ POWER DERATING CURVE



Others data not in the specification of data, please contact us.

如果你要求的規格不在本規格書裡請與我們聯絡。

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□ Test Procedures and Requirements

| Test Item                                     | Procedue  | Requirement   | Test Method              |
|---|---|---|--------------------------|
| Temperature Coefficient of Resistance (T.C.R) | -55°C ~ +155°C, 20°C is the reference temperature   | Refer to Rating   | JIS C 5201-1 clause 4.8  |
| Short Time Overload                           | General:<br>2.5 time RCWV or Max. Overload voltage for 5 seconds.<br>Hifh Power:<br>2.5 times RCWV of Mac. Overload voltage for 2 seconds.  | ±1=±(1.0% +0.05Ω)<br>±5=±(2.0% +0.1Ω)                     | JIS C 5201-1 clause 4.13 |
| IR Reflow                                     | <p>The graph shows a temperature profile for IR reflow. The y-axis is temperature in °C (50 to 250) and the x-axis is time. Key points include: Heating time (indicated by an arrow), Pre Heating Zone (150°C to 180°C), Soldering Zone (90 ± 30 s), and Peak (250 ± 5 °C, 230°C or higher). A 30 ± 10 s dwell time is shown within the soldering zone.</p> | ±1=±(1.0% +0.05Ω)<br>±5=±(1.0% +0.05Ω)                    | SONY SS-00254            |
| Leaching                                      | 260±5°C for 30 seconds  | >95% Coverge  | SONY SS-00254-9          |
| Soldering Heat                                | 260±5°C for 10 seconds  | ±1=±(1.0% +0.05Ω)<br>±5=±(1.0% +0.05Ω)                    | JIS C 5201-2 clause 4.18 |
| Temperature Cycling                           | -55°C to +155°C 5 cycles  | 0.10%,0.50%,1% :<br>±(0.1%+0.05Ω)<br>2%,5%: ±(0.1%+0.01Ω) | JIS C 5201-2 clause 4.19 |
| Electric Iron                                 | Preheating temperature : 350±5°C<br>Electric iron preheating time: 3+1/-0 second  | ±1=±(1.0% +0.05Ω)<br>±5=±(1.0% +0.05Ω)                    | SONY SS-00254-5          |
| Resistance Solcent                            | The tested resistor be immersed into isproply alcohol of 20 ~ 25°C for 60 secs.<br>Then the resistor is left in the room for 48 hours.  | ±1=±(1.0% +0.05Ω)<br>±5=±(1.0% +0.05Ω)                    | JIS C 5201-1 clause 4.29 |
| Load life in Humidity                         | 40±2°C, 90-95% R.H. or Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"  | 0.10%,0.50%,1% :<br>±(0.1%+0.05Ω)<br>2%,5%: ±(2%+0.05Ω)   | JIS C 5201-1 clause 4.24 |
| Load life (Endurance)                         | 70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"   | 0.10%,0.50%,1% :<br>±(0.1%+0.05Ω)<br>2%,5%: ±(2%+0.05Ω)   | JIS C 5201-1 clause 4.24 |
| Insulation Resistance                         | Max. Overload voltage for 1 mimute  | ≥ 10G Ω   | JIS C 5201-1 clause 4.6  |

\* In case resistors operating ambient temperature in excess of the temperature range -55°C ~+155°C power ratio will be derated in accordance with the figure as shown on the right.

□ VOLTAGE RATING OR CURRENT RATING

Resistance Range: ≥ 1Ω

Rated Voltage: The resistor shall have a DC continuous working voltage or a RMS AC continuous working voltage at commercial-line frequency and wave form corresponding to the power rating, as determined formula as following:

$$E = \text{Rated voltage (V)} \quad E = \sqrt{R \times P} \quad P = \text{Power rating (W)} \quad R = \text{Nominal resistance (Ω)}$$

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EC-Q200 High Power Chip Resistor

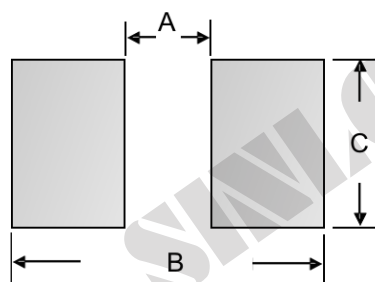
Reliability Test and Requirement

| Test Item                           | Procedure   | Requirement  | Test Method                   |
|-------------------------------------|---|--|-------------------------------|
| Temperature Cycling                 | 1000 Cycles (-55°C ~ +125°C) Measurement at 24±4Hrs afted test conclusion.                                  | 0.1%, 0.5%, 1%: ± (0.5%+0.05Ω). 2%, 5%: ±(1.0%+0.1Ω) | JESD22 Method<br>JA-104       |
| Resistance to Solvent               | Add. Aqueous wash chemical-OKEM clean or equivalent.  | ±1: ±(0.5% + 0.05Ω)<br>±5: ±(0.5% + 0.05Ω)           | MIL-STD-202 Method 215        |
| Biased Humidity                     | 1000 hours 85°C/85%RH.  | 0.1%, 0.5%, 1%: ± (0.5%+0.05Ω). 2%, 5%: ±(2%+0.05Ω)  | MIL-STD-202 Method 103        |
| High Temperature Exposure (Storage) | 1000 hours @T=125°C   | 0.1%, 0.5%, 1%: ± (0.5%+0.05Ω). 2%, 5%: ±(2%+0.05Ω)  | MIL-STD-202 Method 108        |
| ◆ Tolerance: ±1% , ±                | 125°C or Max. working voltage for 1000 hours with 1.5hrs [NO] and 0.5hrs [OFF]                              | 0.1%, 0.5%, 1%: ± (0.5%+0.05Ω). 2%, 5%: ±(3%+0.1Ω)   | MIL-STD-202 Method 108        |
| External Visual                     | Electrical test not required. Inspect device construction, marking and workmanship.                         |  | MIL-STD-883 Method 2009       |
| Mechanical Shock                    | Impact acceleration: 1500g<br>Pulse duration: 0.5ms<br>Number of shocks: 30 shocks (5 shocks for each face) | ±1: ± (1.0%+0.05Ω)<br>±5: ± (2.0%+0.1Ω)              | MIL-STD-202 Method 213        |
| Vibration                           | 5g's for 20min, 12 cycles each of 3 orientation   | ±1: ± (1.0%+0.05Ω)<br>±5: ± (2.0%+0.1Ω)              | MIL-STD-202 Method 204        |
| ESD                                 | 2000V   | For the product %                                    | AEC-Q200-002 or ISO/DIS 10605 |
| Solderability                       | (1) 4hrs 155°C dry heat<br>(2) 265± 5°C 10sec.  | ±1: ± (0.5%+0.05Ω)<br>±5: ± (1.0%+0.05Ω)             | J-STD-002                     |
| Board Flex                          | Beading once for 60 seconds   | ±1: ± (1.0%+0.05Ω)<br>±5: ± (1.0%+0.05Ω)             | AEC-Q200-005                  |

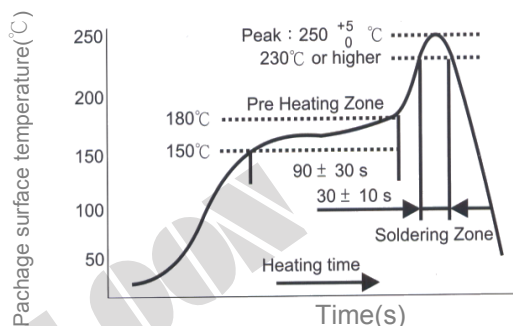
Recommend land pattern design (For reflow soldering)

| Size | A    | B    | C    |
|------|------|------|------|
| 0603 | 0.80 | 2.40 | 1.00 |
| 0805 | 1.30 | 2.90 | 1.45 |
| 1206 | 2.20 | 4.20 | 1.80 |
| 1210 | 2.00 | 4.40 | 2.70 |
| 1812 | 3.11 | 5.91 | 3.20 |
| 2010 | 3.80 | 6.60 | 2.70 |
| 2512 | 4.90 | 8.10 | 3.40 |

unit: mm



Soldering Profile



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**EC-Q200 High Power Chip Resistor**

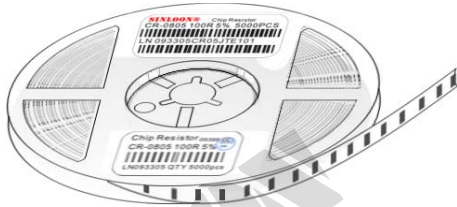
For Resistance According to IEC Publication 63

| E24 |    | E96 |     |     |     |     |     |     |     |
|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 10  | 33 | 100 | 133 | 178 | 237 | 316 | 422 | 562 | 750 |
| 11  | 36 | 102 | 137 | 182 | 243 | 324 | 432 | 576 | 768 |
| 12  | 39 | 105 | 140 | 187 | 249 | 332 | 442 | 590 | 787 |
| 13  | 43 | 107 | 143 | 191 | 255 | 340 | 453 | 604 | 806 |
| 15  | 47 | 110 | 147 | 196 | 261 | 348 | 464 | 619 | 825 |
| 16  | 51 | 113 | 150 | 200 | 267 | 357 | 475 | 634 | 845 |
| 18  | 56 | 115 | 154 | 205 | 274 | 365 | 487 | 649 | 866 |
| 20  | 62 | 118 | 158 | 210 | 280 | 374 | 499 | 665 | 887 |
| 22  | 68 | 121 | 162 | 215 | 287 | 383 | 511 | 681 | 909 |
| 24  | 75 | 124 | 165 | 221 | 294 | 392 | 523 | 698 | 931 |
| 27  | 82 | 127 | 169 | 226 | 301 | 402 | 536 | 715 | 953 |
| 30  | 91 | 130 | 174 | 232 | 309 | 412 | 549 | 732 | 976 |

PACKAGE SPECIFICATION

| Power | Size | Type   | Quantity(ea) |         |         |  |
|-------|------|--------|--------------|---------|---------|--|
|       |      |        | Paper Reel   | Tape    | Carton  |  |
| 1/8W  | 0603 | AQHP03 | 5,000 Pcs    | 7" Reel | 50K pcs | 300K pcs   |
| 1/4W  | 0805 | AQHP05 | 5,000 Pcs    | 7" Reel | 50K pcs | 300K pcs   |
| 1/2W  | 1206 | AQHP06 | 5,000 Pcs    | 7" Reel | 50K pcs | 300K pcs   |
| 4/6W  | 1210 | AQHP10 | 5,000 Pcs    | 7" Reel | 50K pcs | 300K pcs   |
| 1W    | 1812 | AQHP12 | 5,000 Pcs    | 7" Reel | 50K pcs | 300K pcs   |
| 1W    | 2010 | AQHP20 | 5,000 Pcs    | 7" Reel | 50K pcs | 300K pcs   |
| 2W    | 2512 | AQHP25 | 4,000 Pcs    | 7" Reel | 40K pcs | 240K pcs   |

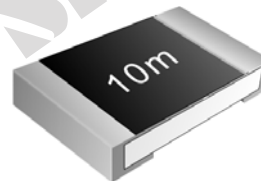
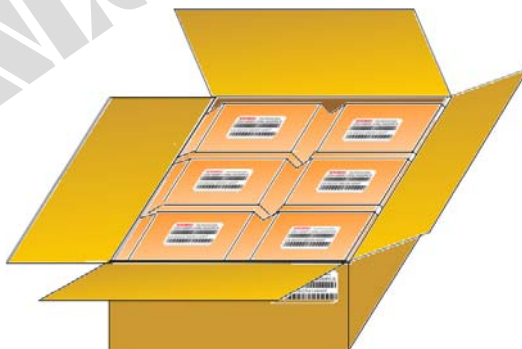
Plastic Reel



Inside box



Carton



※ 美隆電子產品規格特性參數的改變和更新不會另行通知。

※ Mayloon characteristic parameters of electronic product specification changes or updates without prior notice.