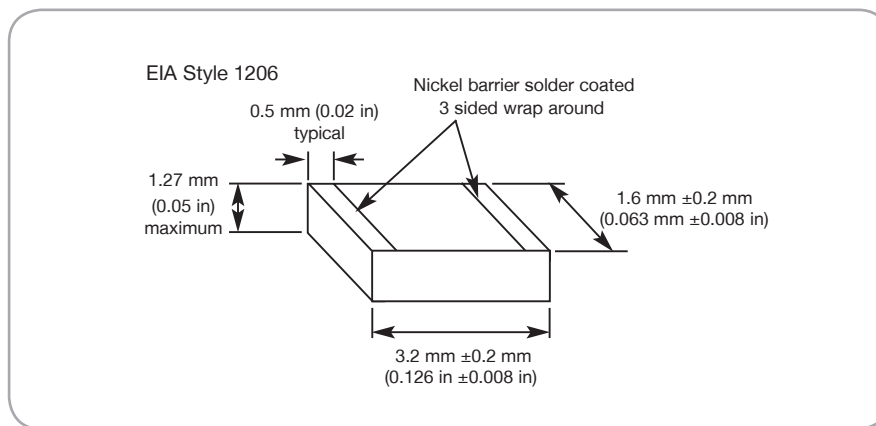


T H E R M O M E T R I C S  
A C O M M I T M E N T T O E X C E L L E N C E

# NTC Type SMD

## Thermometrics Surface Mount Devices



### Features

- Nickel barrier tin plated terminations for soldering
- High sensitivity to changes in temperature
- Wide operating temperature range -40°F to 257°F (-40°C to 125°C)
- Rugged construction
- Available in other material systems
- Intended for temperature measurement, control and compensation
- Suitable for standard soldering techniques
- Excellent solderability without “tombstoning”
- Ceramic between electrodes glass coated for improved stability
- Supplied in tape-and-reel packaging

**Amphenol**  
Advanced Sensors

# Type NHQ Specification

Surface mount chip 1206 size

## Description

A range of 1206 size surface mount NTC chip thermistors. The terminations are nickel barrier with tin plating.

## General

### Soldering Recommendations

- Maximum storage time in closed package: One year
- Maximum storage time exposed to ambient conditions of 59°F to 86°F (15°C to 30°C), 15% to 70% RH: 30 days
- Drying prior to soldering: Not to exceed 48h at 176°F (80°C) or 16h at 212°F (100°C) or 8h at 257°F (125°C)
- Flux type: R or RMA

### Flow Soldering Conditions

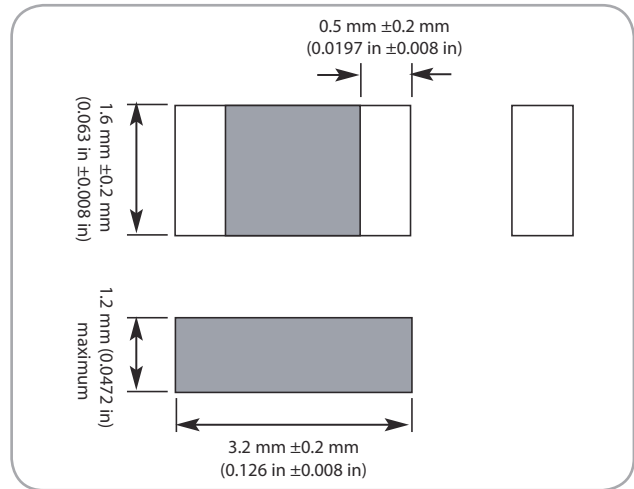
- Preheat temperature: 176°F to 302°F (80°C to 150°C)
- Maximum rate of temperature change: 4.5°F/s or 2.5°C/s
- Maximum solder temperature: 509°F (265°C)
- Maximum dwell time: 10 seconds
- Cooling in ambient or air flow of 5m/s

### Reflow Soldering Conditions

- Method infrared, hot gas, vapor
- Maximum rate of preheat temperature change: 4.5°F/s or 2.5°C/s
- Maximum temperature: 437°F (225°C)
- Maximum time above: 392°F (200°C) 30 seconds
- Maximum radiant flux: (0.1 to 100 W  $\mu$ ) 5 W/cm<sup>2</sup>
- Maximum hot air temperature: 527°F (275°C) at 4 m/s
- Maximum vapor temperature: 419°F (215°C)
- Maximum rate of cooling: 4.5°F/s or 2.5°C/s

### Cleaning

Ultrasonic cleaning in methanol or isopropanol not exceeding 40 kHz for 5 minutes, or aqueous cleaning not exceeding 158°F (70°C) for 7 minutes (recommended).



NTC Type NHQ Outline Drawing

| Code         | R25 $\Omega$ | B (25/85) |
|--------------|--------------|-----------|
| NHQ202B410T5 | 2000         | 4100      |
| NHQ222B410T5 | 2200         | 4100      |
| NHQ252B410T5 | 2500         | 4100      |
| NHQ302B410T5 | 3000         | 4100      |
| NHQ472B355T5 | 4700         | 3550      |
| NHQ502B355T5 | 5000         | 3550      |
| NHQ103B375T5 | 10000        | 3750      |
| NHQ153B400T5 | 15000        | 4000      |
| NHQ203B400T5 | 20000        | 4000      |
| NHQ223B400T5 | 22000        | 4000      |
| NHQ303B400T5 | 30000        | 4000      |
| NHQ333B400T5 | 33000        | 4000      |
| NHQ473B400T5 | 47000        | 4000      |
| NHQ503B400T5 | 50000        | 4000      |
| NHQ104B425T5 | 100000       | 4250      |
| NHQ154B425T5 | 150000       | 4250      |
| NHQ304B435T5 | 300000       | 4350      |
| NHQ474B435T5 | 470000       | 4350      |
| NHQ504B435T5 | 500000       | 4350      |

## Data

- Resistance tolerance at 77°F (25°C)  $\pm$ 5%; for  $\pm$ 10% replace T5 by T10 in code.
- Tolerance on B value  $\pm$ 200 K
- Minimum temperature: -40°F (-40°C)
- Maximum temperature: 257°F (125°C)
- Dissipation factor: 3 mW/K
- Time constant: 8 seconds maximum

# Type NHQM Specification

Surface mount chip 0805 size

## Description

A range of 0805 size surface mount NTC chip thermistors. The terminations are nickel barrier with tin plating.

## General

### Soldering Recommendations

- Maximum storage time in closed package: One year
- Maximum storage time exposed to ambient conditions of 59°F to 86°F (15°C to 30°C), 15% to 70% RH: 30 days
- Drying prior to soldering: Not to exceed 48h at 176°F (80°C) or 16h at 212°F (100°C) or 8h at 257°F (125°C)
- Flux type: R or RMA

### Flow Soldering Conditions

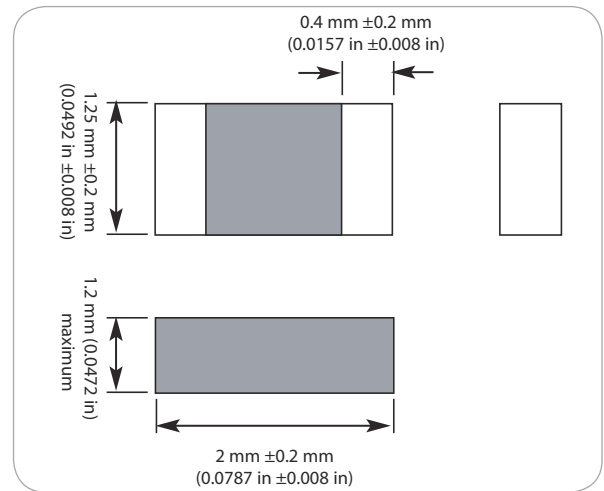
- Preheat temperature: 176°F to 302°F (80°C to 150°C)
- Maximum rate of temperature change: 4.5°F/s or 2.5°C/s
- Maximum solder temperature: 509°F (265°C)
- Maximum dwell time: 10 seconds
- Cooling in ambient or air flow of 5m/s

### Reflow Soldering Conditions

- Method infrared, hot gas, vapor
- Maximum rate of preheat temperature change: 4.5°F/s or 2.5°C/s
- Maximum temperature: 437°F (225°C)
- Maximum time above: 392°F (200°C) 30 seconds
- Maximum radiant flux: (0.1 to 100 W/μ) 5 W μ/cm<sup>2</sup>
- Maximum hot air temperature: 527°F (275°C) at 4 m/s
- Maximum vapor temperature: 419°F (215°C)
- Maximum rate of cooling: 4.5°F/s or 2.5°Cs

### Cleaning

Ultrasonic cleaning in methanol or isopropanol not exceeding 40 kHz for 5 minutes, or aqueous cleaning not exceeding 158°F (70°C) for 7 minutes (recommended).



NTC Type NHQM Outline Drawing

| Code          | R25 Ω  | B (25/85°C) |
|---------------|--------|-------------|
| NHQM202B410T5 | 2000   | 4100        |
| NHQM252B410T5 | 2500   | 4100        |
| NHQM272B410T5 | 2700   | 4100        |
| NHQM302B410T5 | 3000   | 4100        |
| NHQM472B355T5 | 4700   | 3550        |
| NHQM502B355T5 | 5000   | 3550        |
| NHQM682B375T5 | 6800   | 3750        |
| NHQM103B375T5 | 10000  | 3750        |
| NHQM153B400T5 | 15000  | 4000        |
| NHQM203B400T5 | 20000  | 4000        |
| NHQM223B400T5 | 22000  | 4000        |
| NHQM273B400T5 | 27000  | 4000        |
| NHQM303B400T5 | 30000  | 4000        |
| NHQM333B400T5 | 33000  | 4000        |
| NHQM473B415T5 | 47000  | 4150        |
| NHQM503B415T5 | 50000  | 4150        |
| NHQM104B425T5 | 100000 | 4250        |
| NHQM154B425T5 | 150000 | 4250        |
| NHQM304B425T5 | 300000 | 4250        |
| NHQM474B435T5 | 470000 | 4350        |
| NHQM504B435T5 | 500000 | 4350        |

## Data

- Resistance tolerance at 77°F (25°C) ±5%; for ±10% replace T5 by T10 in code.
- Tolerance on B value ±200 K
- Minimum temperature: -40°F (-40°C)
- Maximum temperature: 257°F (125°C)
- Dissipation factor: 1.5 mW/K
- Time constant: 5 seconds maximum

# Type NHQMM Specification

Surface mount chip 0603 size

## Description

A range of 0603 size surface mount NTC chip thermistors. The terminations are nickel barrier with tin plating.

## General

### Soldering Recommendations

- Maximum storage time in closed package: One year
- Maximum storage time exposed to ambient conditions of 59°F to 86°F (15°C to 30°C), 15% to 70% RH: 30 days
- Drying prior to soldering: Not to exceed 48h at 176°F (80°C) or 16h at 212°F (100°C) or 8h at 257°F (125°C)
- Flux type: R or RMA

### Flow Soldering Conditions

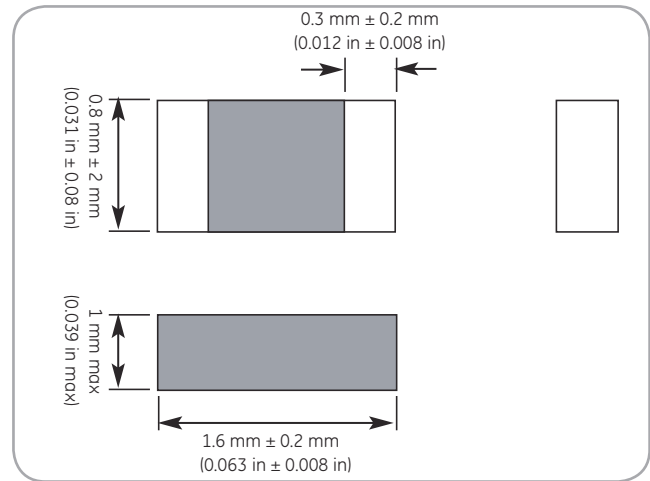
- Preheat temperature: 176°F to 302°F (80°C to 150°C)
- Maximum rate of temperature change: 4.5°F/s or 2.5°C/s
- Maximum solder temperature: 509°F (265°C)
- Maximum dwell time: 10 seconds
- Cooling in ambient or air flow of 5m/s

### Reflow Soldering Conditions

- Method infrared, hot gas, vapor
- Maximum rate of preheat temperature change: 4.5°F/s or 2.5°C/s
- Maximum temperature: 437°F (225°C)
- Maximum time above: 392°F (200°C) 30 seconds
- Maximum radiant flux: (0.1 to 100 W/μ) 5 W/μ/cm<sup>2</sup>
- Maximum hot air temperature: 527°F (275°C) at 4 m/s
- Maximum vapor temperature: 419°F (215°C)
- Maximum rate of cooling: 4.5°F/s or 2.5°C/s

## Cleaning

Ultrasonic cleaning in methanol or isopropanol not exceeding 40 kHz for 5 minutes, or aqueous cleaning not exceeding 158°F (70°C) for 7 minutes (recommended).



NTC Type NHQMM Outline Drawing

| Code           | R25 Ω  | B (25/85) |
|----------------|--------|-----------|
| NHQMM202B410T5 | 2000   | 4100      |
| NHQMM222B410T5 | 2200   | 4100      |
| NHQMM302B410T5 | 3000   | 4100      |
| NHQMM332B410T5 | 3300   | 4100      |
| NHQMM472B355T5 | 4700   | 3550      |
| NHQMM502B355T5 | 5000   | 3550      |
| NHQMM682B355T5 | 6800   | 3550      |
| NHQMM103B375T5 | 10000  | 3750      |
| NHQMM153B380T5 | 15000  | 3800      |
| NHQMM203B380T5 | 20000  | 3800      |
| NHQMM223B380T5 | 22000  | 3800      |
| NHQMM303B400T5 | 30000  | 4000      |
| NHQMM333B400T5 | 33000  | 4000      |
| NHQMM473B400T5 | 47000  | 4000      |
| NHQMM503B400T5 | 50000  | 4000      |
| NHQMM683B400T5 | 68000  | 4000      |
| NHQMM104B415T5 | 100000 | 4150      |
| NHQMM154B425T5 | 150000 | 4250      |
| NHQMM204B425T5 | 200000 | 4250      |

## Data

- Resistance tolerance at 77°F (25°C) ±5%; for ±10% replace T5 by T10 in code
- Tolerance on B value ±200 K
- Minimum temperature: -40°F (-40°C)
- Maximum temperature: 257°F (125°C)
- Dissipation factor: 1.2 mW/K
- Time constant: 4 seconds maximum

# Type NHQT Specification

Surface mount chip 0402 size

## Description

A range of 0402 size surface mount NTC chip thermistors. The terminations are nickel barrier with tin plating.

## General

### Soldering Recommendations

- Maximum storage time in closed package: One year
- Maximum storage time exposed to ambient conditions of 59°F to 86°F (15°C to 30°C), 15% to 70% RH: 30 days
- Drying prior to soldering: Not to exceed 48h at 176°F (80°C) or 16h at 212°F (100°C) or 8h at 257°F (125°C)
- Flux type: R or RMA

### Flow Soldering Conditions

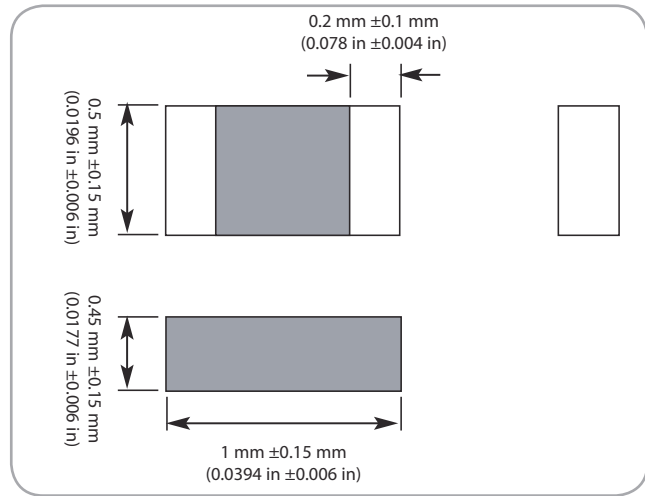
- Preheat temperature: 176°F to 302°F (80°C to 150°C)
- Maximum rate of temperature change: 4.5°F/s or 2.5°C/s
- Maximum solder temperature: 509°F (265°C)
- Maximum dwell time: 10 seconds
- Cooling in ambient or air flow of 5m/s

### Reflow Soldering Conditions

- Method infrared, hot gas, vapor
- Maximum rate of preheat temperature change: 4.5°F/s or 2.5°C/s
- Maximum temperature: 437°F (225°C)
- Maximum time above: 392°F (200°C) 30 seconds
- Maximum radiant flux: (0.1 to 100 W/μ) 5 W/μ/cm<sup>2</sup>
- Maximum hot air temperature: 527°F (275°C) at 4 m/s
- Maximum vapor temperature: 419°F (215°C)
- Maximum rate of cooling: 4.5°F/s or 2.5°C/s

## Cleaning

Ultrasonic cleaning in methanol or isopropanol not exceeding 40 kHz for 5 minutes, or aqueous cleaning not exceeding 158°F (70°C) for 7 minutes (recommended).



NTC Type NHQT Outline Drawing

| Code          | R25 Ω  | B (25/85) |
|---------------|--------|-----------|
| NHQT500B285T5 | 50     | 2850      |
| NHQT202B410T5 | 2000   | 4100      |
| NHQT252B410T5 | 2500   | 4100      |
| NHQT332B410T5 | 3300   | 4100      |
| NHQT352B410T5 | 3500   | 4100      |
| NHQT402B410T5 | 4000   | 4100      |
| NHQT652B410T5 | 6500   | 4100      |
| NHQT153B380T5 | 15000  | 3800      |
| NHQT203B380T5 | 20000  | 3800      |
| NHQT223B380T5 | 22000  | 3800      |
| NHQT303B400T5 | 30000  | 4000      |
| NHQT473B400T5 | 47000  | 4000      |
| NHQT683B400T5 | 68000  | 4000      |
| NHQT154B425T5 | 150000 | 4250      |

## Data

- Resistance tolerance at 77°F (25°C) ±5%; for ±10% replace T5 by T10 in code
- Tolerance on B value ±200 K
- Minimum temperature: -40°F (-40°C)
- Maximum temperature: 257°F (125°C)
- Dissipation factor: 1.5 mW/K
- Time constant: 4 seconds maximum







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[NHQMM154B425T10](#) [NHQM400B280T10](#) [NHQMM302B410T5](#) [NHQMM332B410T5](#) [NHQMM222B410T5](#)  
[NHQMM252B410T5](#) [NHQMM152B345T10](#) [NHQMM202B410T5](#) [NHQMM680B280T10](#) [NHQM474B435T5](#)  
[NHQMM204B425T10](#) [NHQM272B410T10](#) [NHQM473B415T10](#) [NHQMM302B410T10](#) [NHQMM332B410T10](#)  
[NHQM202B410T10](#) [NHQM504B435T5](#) [NHQMM400B280T10](#) [NHQM472B355T10](#) [NHQM502B355T5](#)  
[NHQMM473B400T10](#) [NHQMM153B380T10](#) [NHQMM103B375T5](#) [NHQMM472B355T5](#) [NHQMM102B325T10](#)  
[NHQM152B345T10](#) [NHQMM333B400T5](#) [NHQMM303B400T5](#) [NHQMM680B280T5](#) [NHQMM471B320T5](#)  
[NHQMM300B275T10](#) [NHQMM502B355T10](#) [NHQM103B375T5](#) [NHQMM503B400T10](#) [NHQT683B400T10](#)  
[NHQM472B355T5](#) [NHQMM223B380T5](#) [NHQMM102B325T5](#) [NHQMM203B380T5](#) [NHQM800B280T10](#)  
[NHQMM152B345T5](#) [NHQM203B400T10](#) [NHQMM400B280T5](#) [NHQMM800B280T5](#) [NHQMM502B355T5](#)  
[NHQMM682B355T5](#) [NHQMM800B280T10](#) [NHQM223B400T10](#) [NHQMM682B355T10](#) [NHQMM204B425T5](#)  
[NHQM682B375T5](#) [NHQM473B415T5](#) [NHQM304B425T10](#) [NHQMM101B280T10](#) [NHQM801B325T10](#)  
[NHQM252B410T10](#) [NHQT204B425T10](#) [NHQM503B415T10](#) [NHQM153B400T10](#) [NHQMM333B400T10](#)  
[NHQMM202B410T10](#) [NHQM153B400T5](#) [NHQM154B425T10](#) [NHQMM501B320T5](#) [NHQMM101B280T5](#)  
[NHQMM222B410T10](#) [NHQM502B355T10](#) [NHQM102B325T5](#) [NHQM501B325T5](#) [NHQM333B400T10](#)  
[NHQM103B375T10](#) [NHQM801B325T5](#) [NHQM504B435T10](#) [NHQM501B325T10](#) [NHQM152B345T5](#)  
[NHQMM503B400T5](#) [NHQM303B400T10](#) [NHQM202B410T5](#) [NHQM252B410T5](#) [NHQM272B410T5](#)  
[NHQMM473B400T5](#) [NHQM302B410T10](#) [NHQM474B435T10](#) [NHQMM153B380T5](#) [NHQM101B280T10](#)  
[NHQM102B325T10](#) [NHQMM683B400T5](#) [NHQMM154B425T5](#) [NHQM221B310T10](#) [NHQM101B280T5](#)  
[NHQM303B400T5](#) [NHQM333B400T5](#) [NHQMM103B375T10](#) [NHQM682B375T10](#) [NHQMM104B415T10](#)

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