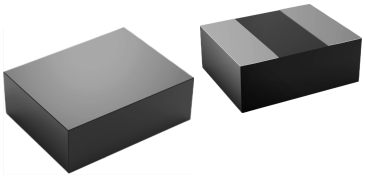
MetalLions

# MTQH101030S Series
## Molded Power Inductors



## FEATURES

- Metal material for large current and low loss
- Vinyl thermal spray, better surface compactness
- Closed magnetic circuit design reduces leakage flux
- Operate temperature range .... －55℃～＋125℃(Including self temp. rise)
- RoHS compliant

## APPLICATIONS

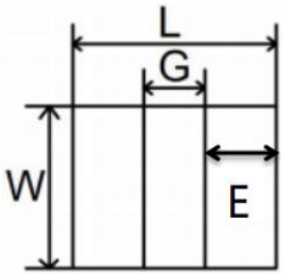
- Smart phone， pad
- Notebooks, VR, AR
- Portable gaming devices, Smart wear, Wi-Fi module
- Baseband power supply, Amplifier, Power management, Module power supply, Camera power manageme.

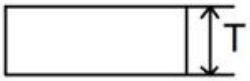
## Explanation of Part Number

| MTQH | 101030 | S | 2R2 | M | B | T |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

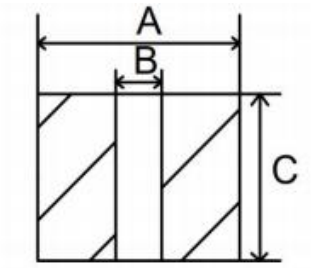
- 1:Series Name: Molding power inductors
- 2:Size Code: L*W*T
- 3: Material Code:S Type
- 4:Initial inductance value: 2R2 = 2.2uH
- 5:Tolerance of Inductance:M:±20%
- 6:Coating color:B=Black,G=Gray
- 7:Packing:Tape Carrier Package

## Dimensions: [mm]




## Land Pattern: [mm]




| Series | L | G | W | E | T | A | B | C |
|---|---|---|---|---|---|---|---|---|
| MTQH101030S | 10.2±0.2 | 3.6±0.2 | 10.0±0.2 | 3.30±0.2 | 3.00Max. | 10.50 | 3.20 | 10.30 |

## Electrical Properties:

| P/N | L0(μH) @(0A) 1MHz | Rdc(mΩ) | | Heat rating current Irms(A) | | Saturation current Isat(A) | |
|---|---|---|---|---|---|---|---|
| | | Typical | Max | Typical | Max | Typical | Max |
| MTQH101030S3R3M□T | 3.3 | 10 | 12 | 16 | 15 | 16 | 15 |
| MTQH101030S4R7M□T | 4.7 | 15 | 18 | 13 | 12 | 14 | 13 |
| MTQH101030S6R8M□T | 6.8 | 21 | 25 | 11 | 10 | 11 | 10 |
| MTQH101030S100M□T | 10.0 | 33 | 38 | 8.0 | 7.0 | 10.0 | 9.0 |

Test remarks

Note 1.: All test data is referenced to 25 ℃ ambient.

Note 2.: Test Condition:1MHz, 1.0Vrms.

Note 3.: Irms:DC current (A) that will cause an approximate △T of 40 ℃.

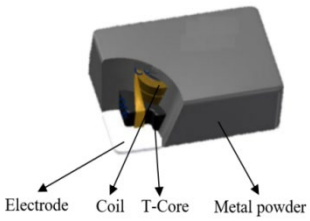
Note 4.: Isat:DC current (A) that will cause L0 to drop approximately 30%.

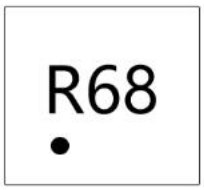
Note 5.: Operating Temperature Range -55℃ to + 125℃.

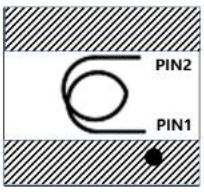
Note 6.: The part temperature (ambient + temp rise) should not exceed 125 under ℃ the worst case operating conditions. Circuit design, component placement, PCB trace size and thickness, airflow and other cooling provision all affect the part temperature. Part temperature should be verified in the end application.

Note 7.: The rated current as listed is either the saturation current or the heating current depending on which value is lower.

## Structure

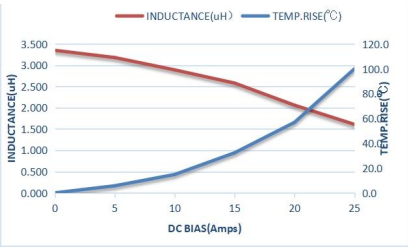


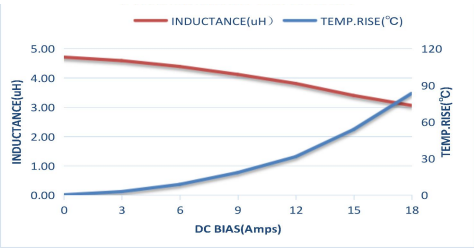




## Current Characteristic

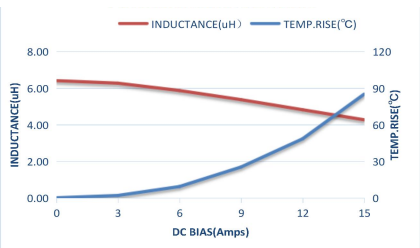
MTQH101030S3R3MBT



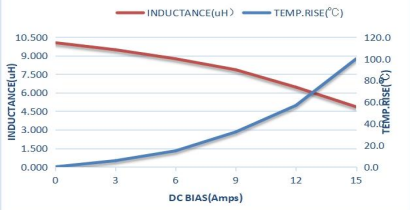

MTQH101030S4R7MBT



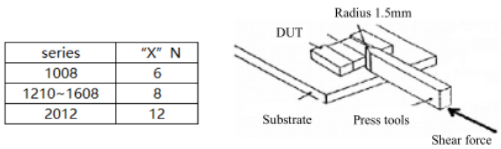
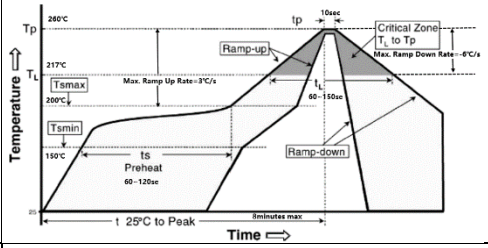
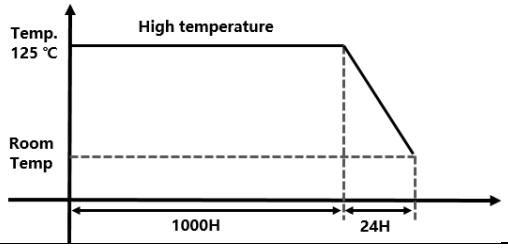
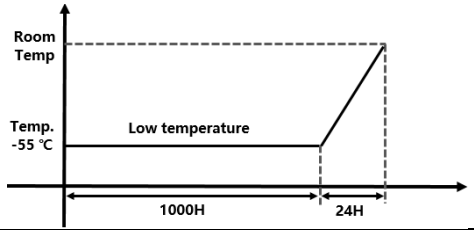

MTQH101030S6R8MBT

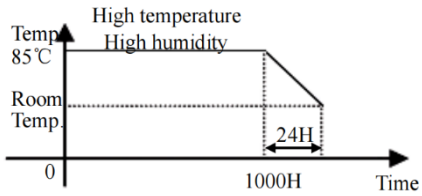
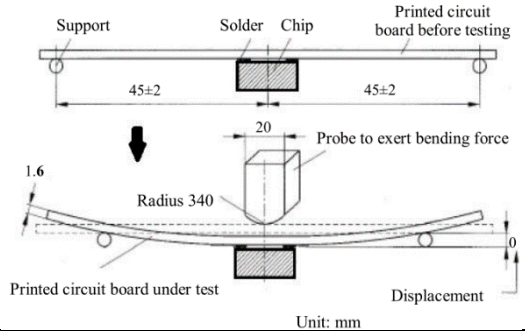



MTQH101030S100MBT



## Reliability

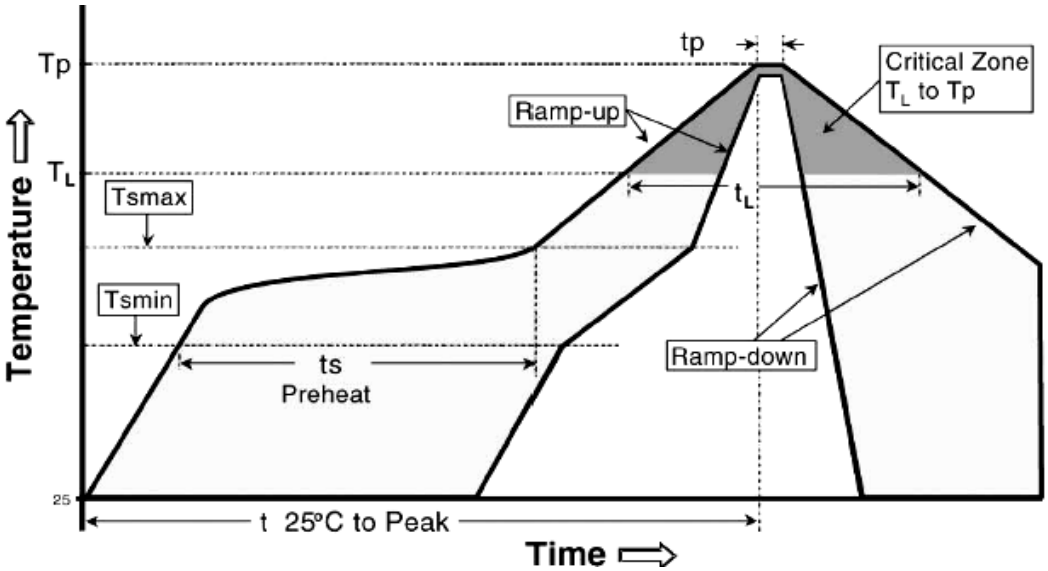
| No. | Item | Requirements | Test Methods and Remarks | Reference | Sample Size |
|---|---|---|---|---|---|
| 1 | Solderability | (1) No case deformation or change in appearance.<br>(2) Terminal area must have 95% min. Solder coverage. | ①Temperature:245± 5℃.<br>②Solder Composition: Sn/Ag3.0/Cu0.5(Pb-Free).<br>③Sample immersion tin furnace 5 ±0.5s. | AEC-Q200 (J-STD 002) | 32 |
| 2 | Adhesion of teral electrode | (1)Strong bond between the pad and the core, without come off PCB. | ①Preconditioning：245℃Reflow 3 times<br>②Inductors shall be subjected to (260+0/-5℃.)℃ for (10±5)s Soldering in the base whit 0.3mm solder.<br>③Aplombelectrode way plus tax 12 N for (10±1) seconds.<br>  <br><br>series / "X" N<br>1008 / 6<br>1210~1608 / 8<br>2012 / 12 | AEC-Q200 (AEC-Q200-006) | 32 |
| 3 | Reflow test | (1) No physical damage.<br>(2) \| ΔL0/L0 \| ≤10% | ① The peak temperature: 260+0/-5℃.<br>② Reflow:3times.<br>③ Temperature curve is as below<br>  <br> | AEC-Q200 (MIL-STD-202 Method 210) | 32 |
| 4 | High temperature | (1) No physical damage.<br>(2) \| ΔL0/L0 \| ≤10% | ① Preconditioning: Bake at 125+5℃ for 24±0.5H，245℃Reflow 3 times<br>②Temperature: 125±2℃.<br>③ Time : 1000 hours.<br>④Measurement at 24±4 hours after test conclusion<br>  <br> | AEC-Q200 (MIL-STD -202 Method 108) | 77 |
| 5 | Low temperature | (1) No physical damage.<br>(2) \| ΔL0/L0 \| ≤10% | ①Preconditioning: Bake at 125+5℃ for 24±0.5H，245℃Reflow 3 times<br>②Temperature: -55±2℃.<br>③Time : 1000 hours.<br>④ Measurement at 24±4 hours after test conclusion<br>  <br> | JESD22-A119A | 77 |
| 6 | Thermal shock | (1) No physical damage.<br>(2) \| ΔL0/L0 \| ≤10% | ①Preconditioning: Bake at 125+5℃ for 24±0.5H，245℃Reflow 3 times<br>②Repeat 500 cycle as follow :<br>(-55±2 ℃ ,30±3minutes) 、(Room temperature, 5 minutes)、(+125±2 ℃ ,30±3minutes)、(Room temperature, 5 minutes)<br>③Measurement at 24±4 hours after test conclusion | MIL-STD -202 Method 107 | 77 |

| No. | Item | Requirements | Test Methods and Remarks | Reference | Sample Size |
|---|---|---|---|---|---|
| 7 | Resistance to Soldering Heat | (1) No physical damage.<br>(2) \| ΔL0/L0 \| ≤10% | ①Solder Composition: Sn/Ag3.0/Cu0.5(Pb-Free).<br>②Solder Temperature: 260±5℃.<br>③Immersion Time: 10±1sec. | AEC-Q200（MIL-STD-202 Method 210） | 32 |
| 8 | Static Humidity | (1) No physical damage.<br>(2) \| ΔL0/L0 \| ≤10% | ①Preconditioning: Bake at 125+5℃ for 24±0.5H，245℃Reflow 3 times<br>②1000 hours, 85°C/85%RH.<br>③ Unpowered.<br>④Measurement at 24±4 hours after test conclusion<br>  | AEC-Q200 (MIL-STD-202 Method 103) | 77 |
| 9 | Board Flex | (1) No physical damage.<br>(2) \| ΔL0/L0 \| ≤10% | ①Preconditioning：245℃Reflow 3 times<br>②Part mounted on a 100mm*40mm FR4 PCB board, which is 1.6±0.2 mm thick and as a Layer-thickness 35 µm ± 10 µm.<br>③ Bending speed is 1mm/s.<br>④ Keeping the P.C Board 2 mm minimum for 60 seconds.<br>  | AEC-Q200 (AEC-Q200-005) | 30 |
| 10 | Vibration | (1) No physical damage.<br>(2) \| ΔL0/L0 \| ≤10% | ①Preconditioning：245℃Reflow 3 times<br>②Frequency range : 10~2000Hz.<br>③Amplitude: 1.5mm or 20g.<br>④ Sweep time and duration: 10~2000~10Hz for 20 minutes.<br>⑤ Each four hours in X,Y,Z direction, 12hours in total. | AEC-Q200 (MIL-STD-202 Method 204) | 32 |
| 11 | Mechanical Shock | (1) No physical damage.<br>(2) \| ΔL0/L0 \| ≤10% | ① Preconditioning：245℃Reflow 3 times<br>②Peak acceleration:100G/S<br>③Duration of pulse:6ms<br>④3times in each of 6(±X, ±Y, ±Z) axes. | AEC-Q200 (MIL-STD-202 Method 213) | 32 |
| 12 | Loading at High Temperature | (1) No physical damage.<br>(2) \| ΔL0/L0 \| ≤10% | ①Preconditioning: Bake at 125+5℃ for 24±0.5H，245℃Reflow 3 times<br>②Temperature: 85±2℃.<br>③ Time : 1000 hours.<br>④ Applied Current : Rated current.<br>⑤Measurement at 24±4 hours after test conclusion | AEC-Q200 (MIL-STD-202 Method 108) | 77 |

## Soldering Condition

**(This is for recommendation, please customer perform adjustment according to actual application)**

Recommend Reflow Soldering Profile：(solder : Sn96.5 / Ag3 / Cu0.5)



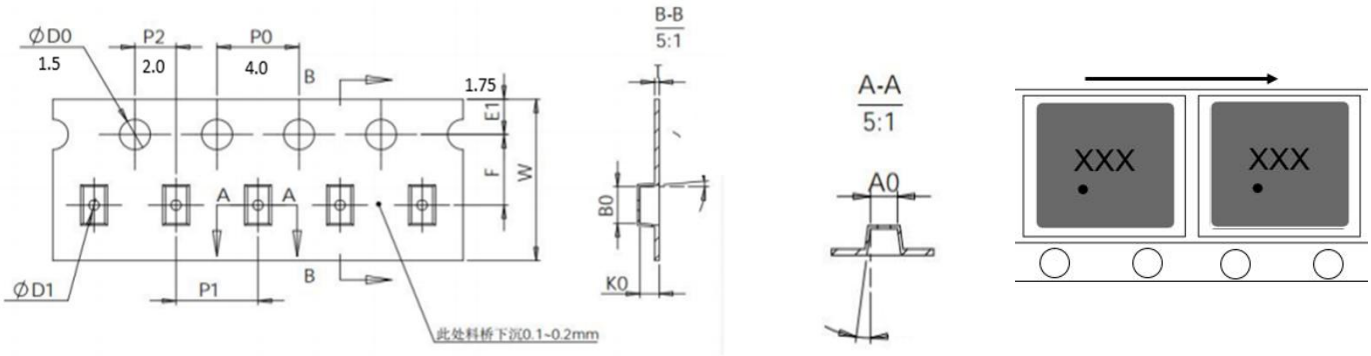

| Profile Feature | Lead (Pb)-Free solder |
|---|---|
| Preheat：<br>Temperature Min ($Ts_{min}$)<br>Temperature Max ($Ts_{max}$)<br>Time ($Ts_{min}$ to $Ts_{max}$ ) (ts) | <br>150℃<br>200℃<br>60 -120 seconds |
| Average ramp-up rate：<br>(Ts max to Tp) | <br>3℃ / second max. |
| Time maintained above :<br>Temperature ($T_L$)<br>Time ($t_L$) | <br>217℃<br>60-150 seconds |
| Peak Temperature (Tp) | 260℃ |
| Time within $^{+0}_{-5}$℃ of actual peak Temperature (tp)[2] | 10 seconds |
| Ramp-down Rate | 6℃/second max. |
| Time 25℃ to Peak Temperature | 8minutes max. |

Allowed Re-flow times : 2 times

Remark : To avoid discoloration phenomena of chip on terminal electrodes, please use $N_2$ Re-flow furnace .

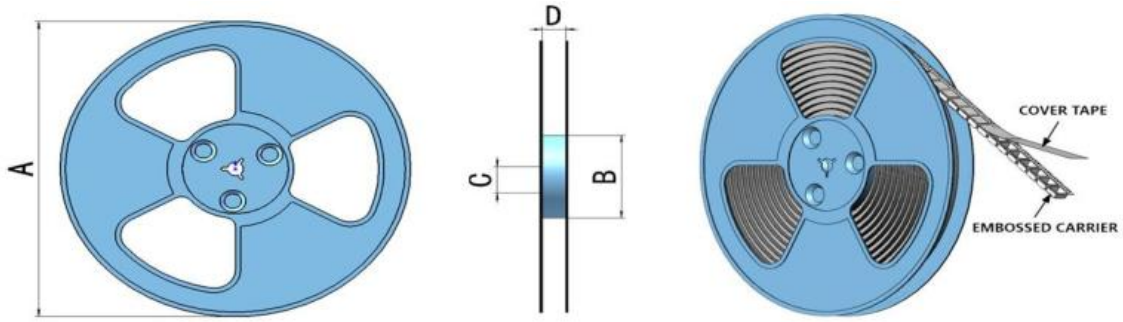
## Packing

1. Dimension of plastic taping: (Unit: mm)
   The following dimensions are related to the actual fit of the machine， for reference only.




| Series/mm | W | A0 | B0 | D1 | F | K0 | P1 | T |
|---|---|---|---|---|---|---|---|---|
| 公差 | / | / | / | ±0.20 | ±0.10 | / | ±0.10 | ±0.05 |
| 101030 | 24.0±0.30 | 10.50±0.10 | 10.50±0.10 | 1.5 | 11.5 | 3.20±0.10 | 16.0 | 0.40 |

2. Dimension of Reel：(Unit: mm)




| Series/mm | A | B | C | D | QTY/Reel |
|---|---|---|---|---|---|
| 公差 | ±2.0 | ±1.0 | ±1.0 | ±1.0 | / |
| 101030 | 330 | 100 | 13.5 | 24.5 | 1000pcs |