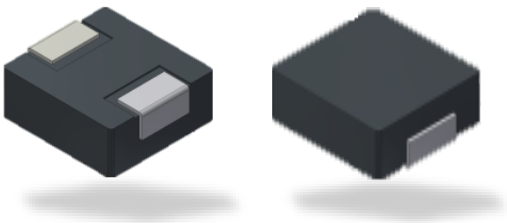


# PMA1054

## High Current, Power Inductors

## Description

- AEC-Q200 qualified
- Halogen Free
- 155℃ maximum total temperature operation
- 11.5x10.3x 5.4mm max. surface mount package
- Powder iron core material
- Magnetically shielded, low EMI
- High current carrying capacity, Low core losses
- RoHS compliant

## Application

**Engine and Powertrain Systems**

- Electric pumps, motor control and auxiliaries
- Powertrain control module (PCU)
- Engine Control unit (ECU)

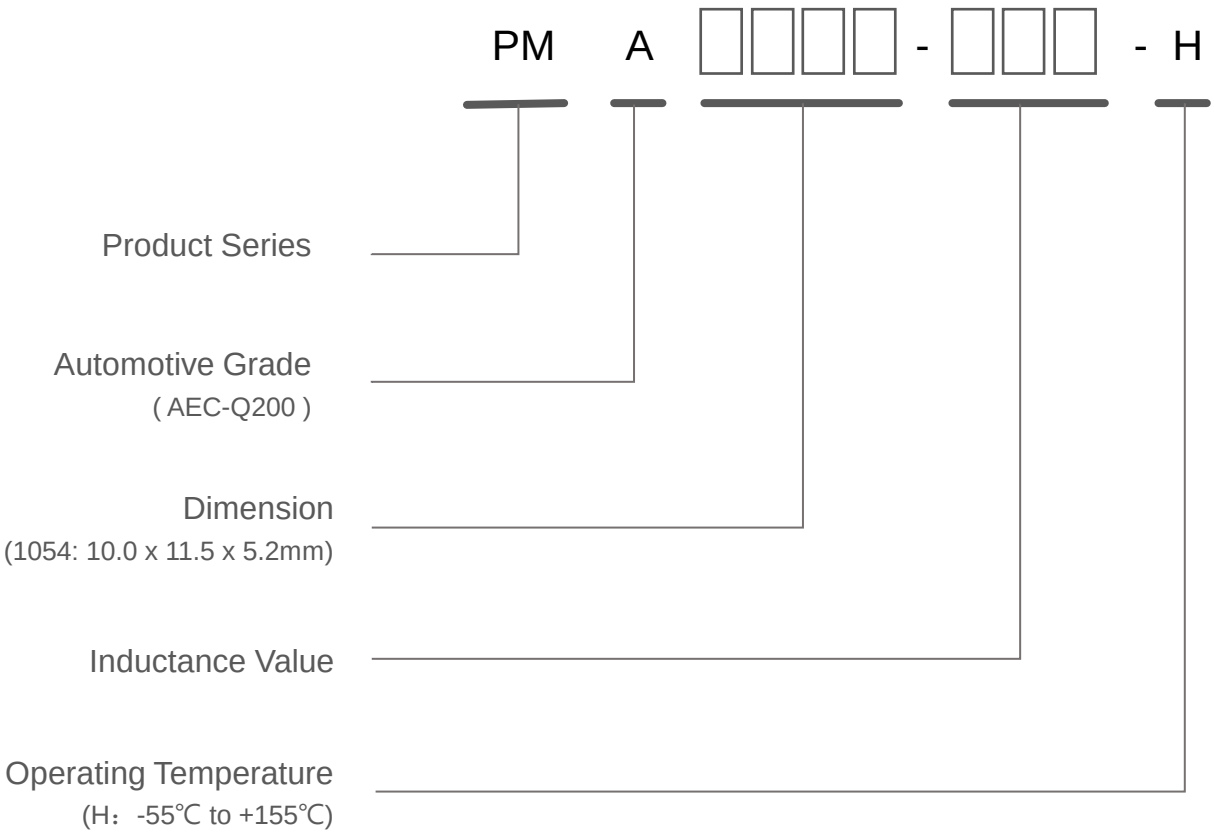
**Body electronics**

- Central body control module
- Vehicle control system
- Headlamps, tail lamps and interior lighting
- Electronic stability control system (ESC)

# Environmental Data

- Storage temperature range: -55℃ to +155 ℃
- Operating temperature range: -55℃ to +155℃
- (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant

# Ordering Information



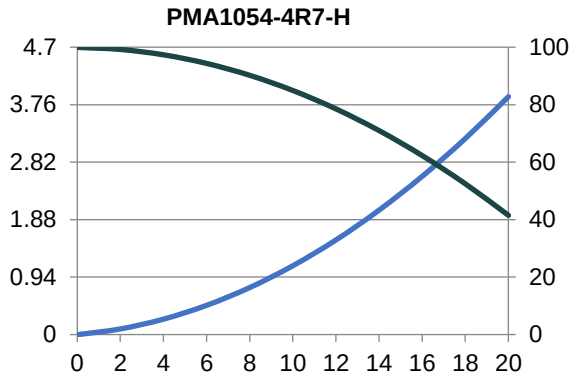
# Product Specifications

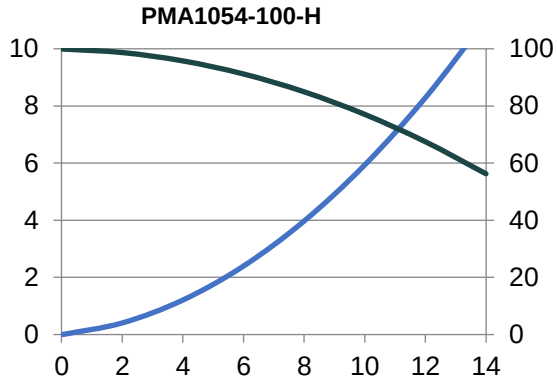
| Part No. | Inductance | DC Resistance | | Heating Rating Current | Saturation Current |
|---|---|---|---|---|---|
| | L0 (μH) | DCR (mΩ) | | Idc (A) | Isat (A) |
| | ±20 %, 100kHz, 1V | TYP. | MAX. | TYP. | TYP. |
| PMA1054-4R7-H | 4.7 | 8.3 | 10.0 | 13.0 | 13.5 |
| PMA1054-100-H | 10.0 | 21.0 | 24.2 | 7.8 | 10.9 |
| PMA1054-150-H | 15.0 | 27.2 | 31.3 | 6.8 | 7.9 |
| PMA1054-220-H | 22.0 | 43.5 | 50.0 | 5.4 | 7.5 |
| PMA1054-330-H | 33.0 | 65.5 | 75.3 | 4.3 | 6.5 |
| PMA1054-470-H | 47.0 | 89.0 | 103.0 | 3.6 | 4.2 |

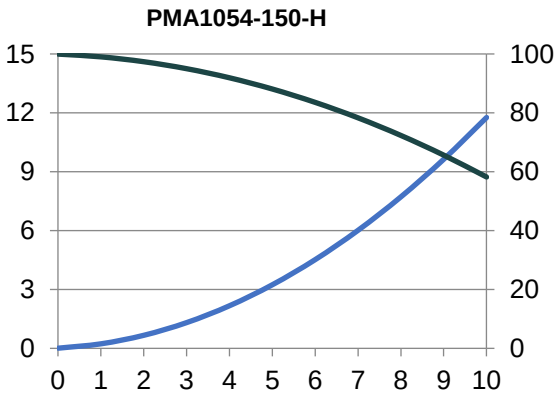
**Notes**

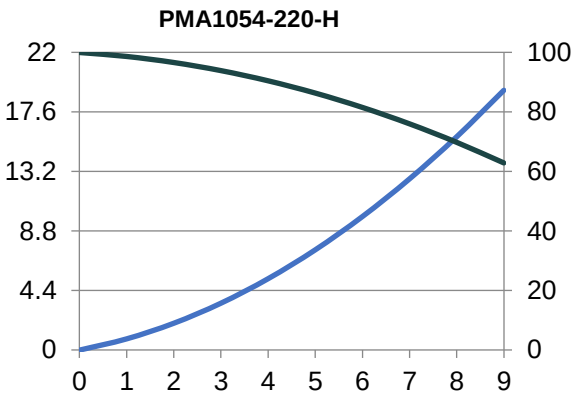
1. All test data is referenced to 25 ℃ ambient temperature
2. Operating temperature range - 55 ℃ to + 155 ℃
3. Idc(A):DC current (A) that will cause an approximate ΔT of 40 ℃(reference ambient temperature is 25 ℃)
4. Isat(A):DC current (A) that will cause L0 to drop approximately 30 %
5. The part temperature (ambient + temp rise) should not exceed 155 ℃ under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

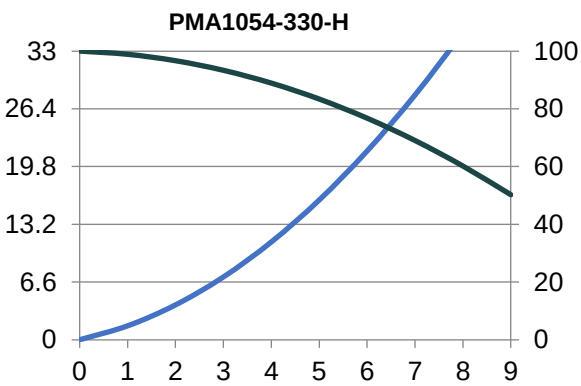
# Inductance and temperature rise vs. current

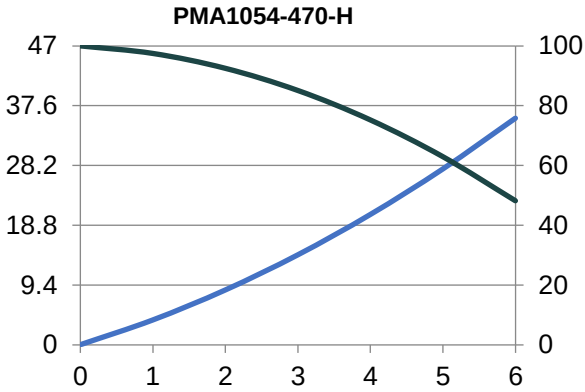



**Legend**

Inductance

Temperature rise

X–axis: $I_{DC}$ (A)
Y–axis (primary): Inductance (μH)
Y–axis (Secondary): Temperature rise (℃)

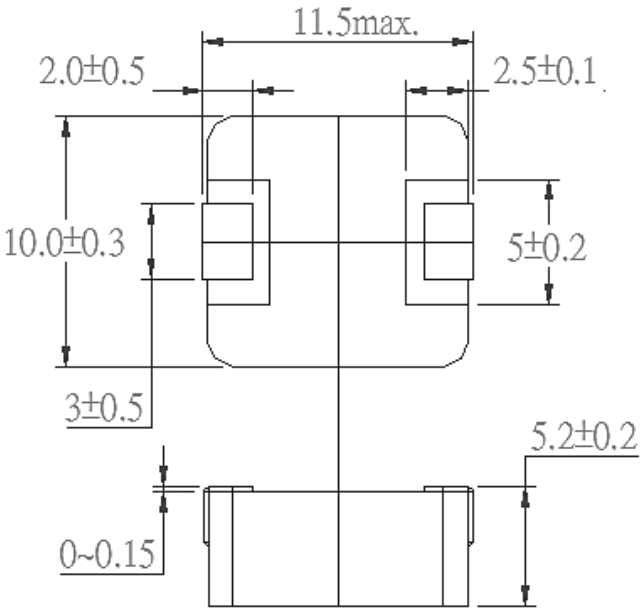
**Test Condition**

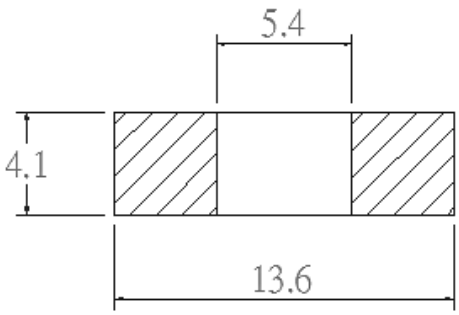
Temperature: 25 ± 2℃
Humidity: < 70% RH
Frequency: 100 KHz, 1.0V

| Mechanical Reliability | | |
|---|---|---|
| Item | Specification and Requirement | Test Method |
| Solderability | The surface of terminal immersed shall be minimum of 95% covered with a new coating of solder | Solder heat proof:<br>1. Precondition: 8 hours steam aging<br>2. Retention time: 255 ± 5 ℃ for 5 ± 0.5 seconds |
| Vibration | Inductance change: Within ± 10% Without mechanical damage such as break | 1. Vibration frequency:(10 Hz to 2000 Hz)<br>2. Vibration time:Each four hours (12 times) in X, Y, Z direction: 12 hours in total<br>3. Amplitude: 1mm or 10 G |
| Shock | Inductance change: Within ± 10% Without mechanical damage such as break | 1. Peak value: 100 G<br>2. Duration of pulse: 6ms<br>3. Waveform: Half-sine Shocks; 3 times in X, Y, Z direction, 9 times in total |

| Endurance Reliability | | |
|---|---|---|
| Item | Specification and Requirement | Test Method |
| Thermal Shock | Inductance change: Within ± 10% Without distinct damage in appearance | 1. Repeat 1000 cycles as follow:<br>(-55 ± 2 ℃; 30 ± 3 min)<br>→ (+155 ± 2 ℃, 30 ± 3 min) change over time of temperature: ≤10s<br>2. Recovery: 24 + 4 / -0 hours of recovery under the standard condition after the test. |
| High Temperature &Humidity | Inductance change: Within ± 10% Without distinct damage in appearance | 85℃85%RH， Duration:240+4/-0 hours |
| Operational Life | Inductance change: Within ± 10% Without distinct damage in appearance | 1.Rated current（Idc） Environment condition: 85 ℃<br>2.Duration: 1000 + 4 / -0 hours |
| Low Temperature Store | Inductance change: Within ± 10% Without distinct damage in appearance | Store temperature:<br>-55 ± 2 ℃,1000 + 4 / -0 hours |
| High Temperature Store | Inductance change: Within ± 10% Without distinct damage in appearance | Store temperature:<br>+155 ± 2 ℃,1000 + 4 / -0 hours |

# Dimensions



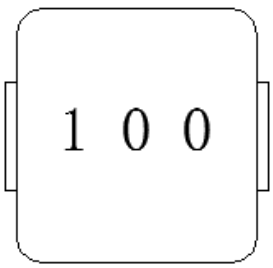




Recommend Land Pattern Dimensions

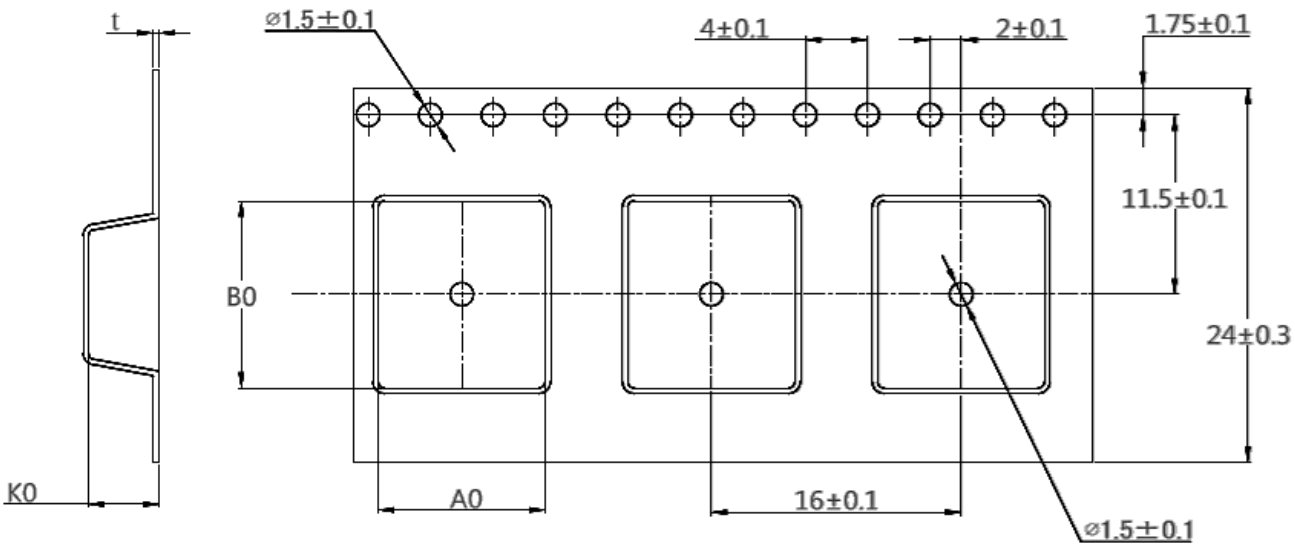
Note：Dimensions in mm

# Marking

The inductor is marked with a 3-digit code
Example for 10.0 μH it will be marked as 100
Note：Using laser for marking

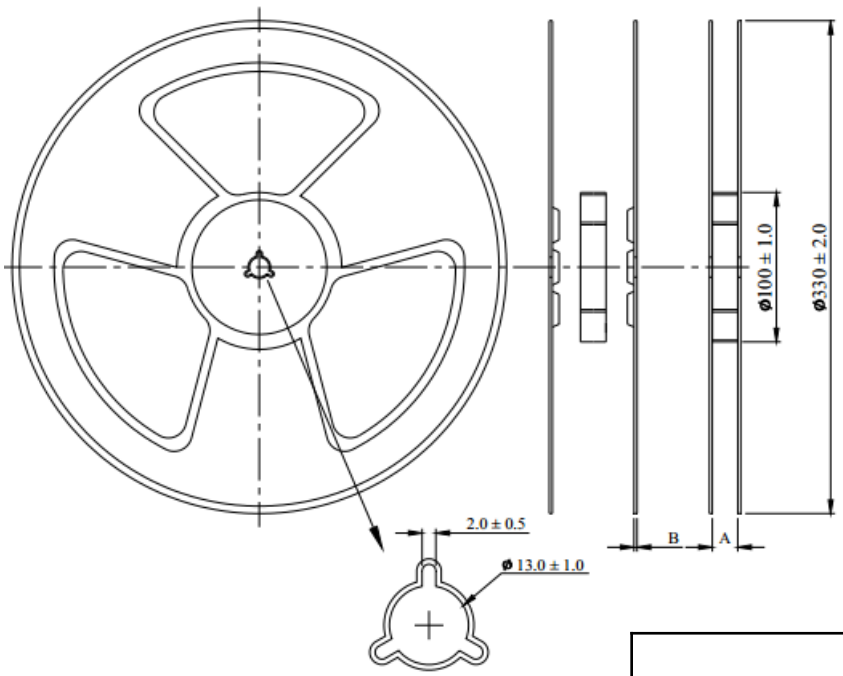


# Tape Packaging Dimensions




| A0 | B0 | K0 | t |
|---|---|---|---|
| 10.7 ± 0.10 | 12.0 ± 0.10 | 5.5 ± 0.1 | 0.35 ± 0.025 |

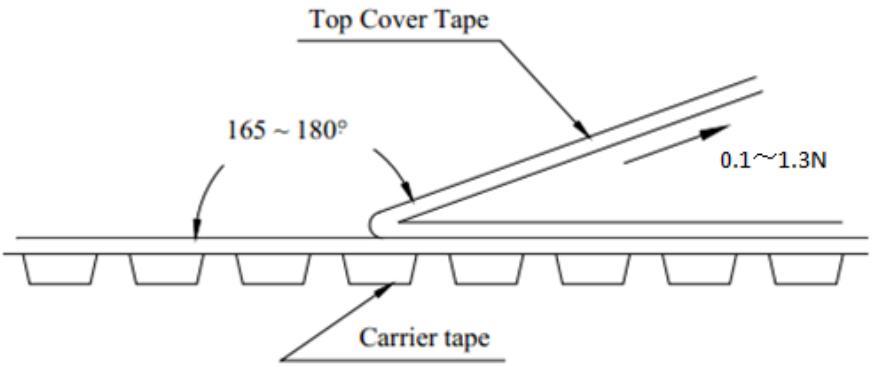
# Reel Dimensions




| | A | B |
|---|---|---|
| mm | 24.5 ± 0.2 | 2.0 ± 0.2 |

# Peel force of top cover tape

The peel speed shall be about 300mm/minute
The peel force of top cover tape shall be between 0.1 to 1.3 N




# Numbers of taping

500 pieces/reel



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