

# SPECIFICATION FOR APPROVAL

## 产品承认书

CUSTOMER: \_\_\_\_\_

CUSTOMER NO. : \_\_\_\_\_

FPE PART NO. : **CL50505303R3M1**

DESCRIPTION: SMD Power Inductor

ATTACHMENT:

■ SPECIFICATION      Rev: A

**CUSTOMER APPROVAL**  
(客户承认章)

**FPE APPROVAL**  
(公司承认章)



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| Recision Change Record |                        |            |
|------------------------|------------------------|------------|
| REV                    | Description of changes | Date       |
| A                      | 新版制作                   | 2024-11-27 |
|                        |                        |            |
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## Molded power inductors

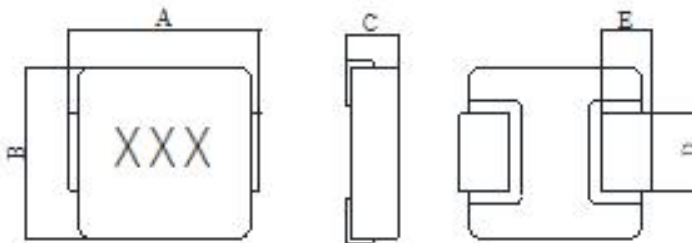
### 1. General specification:



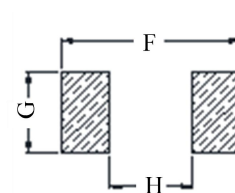
- ◆Part Number: CL5050530 - 1
- ◆Specification: Composite forming SMD inductors
- ◆ Operating temp range: -40°C TO +125°C
- ◆Package: SMD

### 2. Mechanical Specification:

#### 2.1 Dimension/mm:

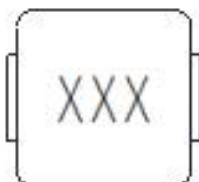


#### 2.2 Recommended Layout/m

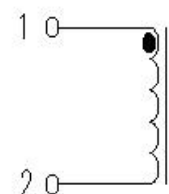


| P/N          | A               | B               | C             | D             | E             | F | G   | H   |
|--------------|-----------------|-----------------|---------------|---------------|---------------|---|-----|-----|
| CL5050530 -1 | $5.45 \pm 0.35$ | $5.18 \pm 0.25$ | $2.8 \pm 0.2$ | $2.2 \pm 0.3$ | $1.2 \pm 0.4$ | 6 | 2.5 | 2.5 |

#### 2.3 Marking code:



#### 2.4 Schematic:



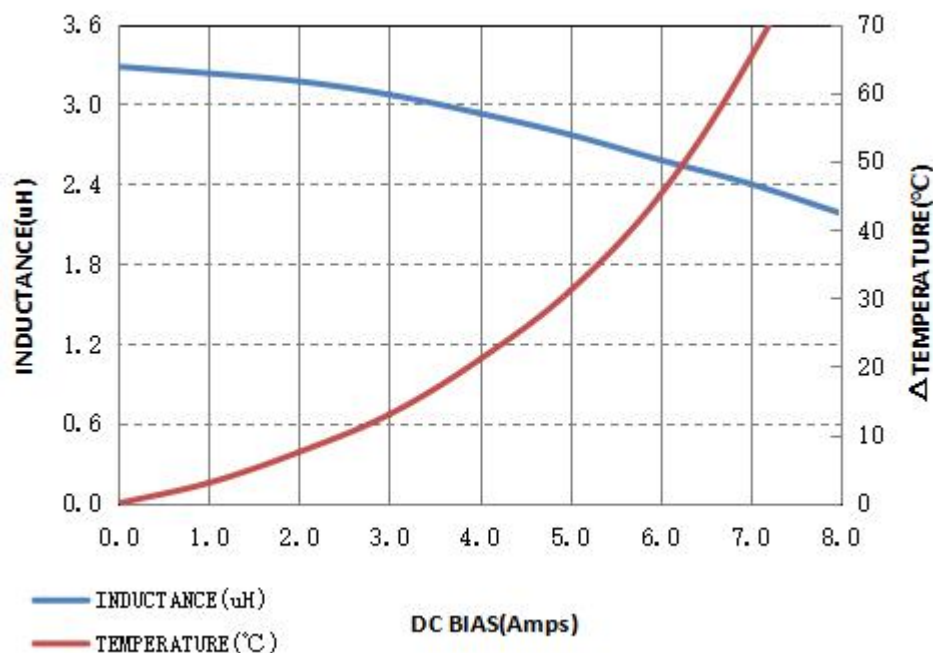
### 3. Electrical specifications @25°C:

#### 3.1 Specification

| P/N            | L0( $\mu$ H) $\pm$ 20%<br>'@0A | DCR (m $\Omega$ ) |     | Heat Rating<br>Current | Saturation<br>Current |
|----------------|--------------------------------|-------------------|-----|------------------------|-----------------------|
|                | 100KHz/ 1.0V                   | Typical           | Max | Idc (Amp)<br>Typical   | Isat (Amp)<br>Typical |
| CL50505303R3M1 | 3.3                            | 35                | 42  | 4.5                    | 6                     |

- All test data is referenced to 25°C ambient.
- DC current (Idc) that will cause an approximate  $\Delta T$  of 40°C.
- DC current (Isat) that will cause Lo to drop approximately 30%.
- Operating temperature Range:-40°C to +125°C.
- The part temperature (ambient + temp rise) should not exceed 125 °C 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.

#### 3.2 Electrical Characteristics Graph



#### 4.RELIABILITY --- Mechanical:

| Item               | Required Characteristics                                                           | Test Method/Condition                                                                                                |
|--------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| Solderability test | Terminals area must have 95% min.                                                  | Dip pads in flux then dip in solder pot at 260±5°C for 10 second.                                                    |
| Vibration test     | 1.No case deformation or change in appearance.<br>2.ΔL/L ≤ 10%<br>3.ΔDCR/DCR ≤ 10% | Apply frequency 10~55Hz. 1.5mm amplitude in each of perpendicular direction for 2 hours.(total 6 hours)              |
| Drop test          | 1.No case deformation or change in appearance.<br>2.ΔL/L ≤ 10%<br>3.ΔDCR/DCR ≤ 10% | Packaged & Drop down from 1m with 981m/s <sup>2</sup> (100G) attitude In 1 angle 1 ridges & 2 surfaces orientations. |

#### RELIABILITY --- Endurance:

| Item                          | Required Characteristics                                                           | Test Method/Condition                                                                                                           |
|-------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| High temperature Storage test | 1.No case deformation or change in appearance.<br>2.ΔL/L ≤ 10%<br>3.ΔDCR/DCR ≤ 10% | Temperature: 125±2°C Time : 1000±2 hours<br>Tested not less than 1 hour, nor more than 2 hours at room temperature.             |
| Low temperature Storage test  | 1.No case deformation or change in appearance.<br>2.ΔL/L ≤ 10%<br>3.ΔDCR/DCR ≤ 10% | Temperature: -40±2°C Time : 1000±2 hours<br>Tested not less than 1 hour, nor more than 2 hours at room temperature.             |
| Thermal shock test            | 1.No case deformation or change in appearance.<br>2.ΔL/L ≤ 10%<br>3.ΔDCR/DCR ≤ 10% | First -40°C for 30 time, next +125°C 30 time as 1 cycle. Go through 96 cycles.                                                  |
| Humidity test                 | 1.No case deformation or change in appearance.<br>2.ΔL/L ≤ 10%<br>3.ΔDCR/DCR ≤ 10% | (1) Environment condition: 85 ±2 °C Humidity : 85%. Applied Current : Rated current (2) Duration : 1,000 +4/-0 hours (See Note) |

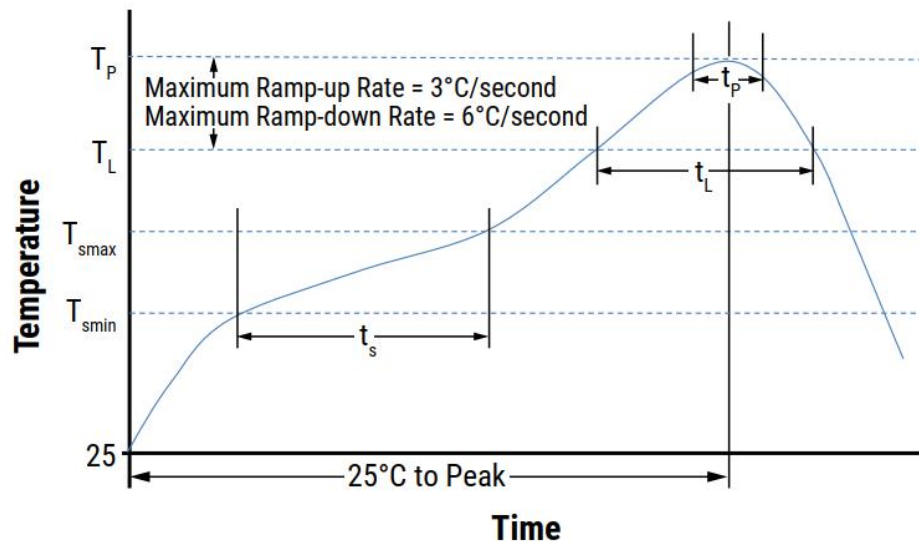
## 5. Soldering and Mounting

### 5-1. Soldering

Mildly activated rosin fluxes are preferred. FPE terminations are suitable for all wave and re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

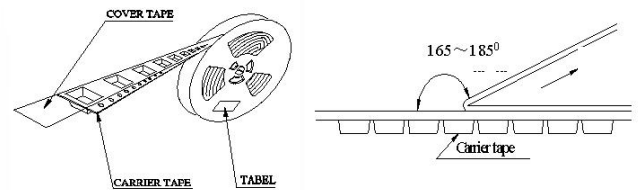
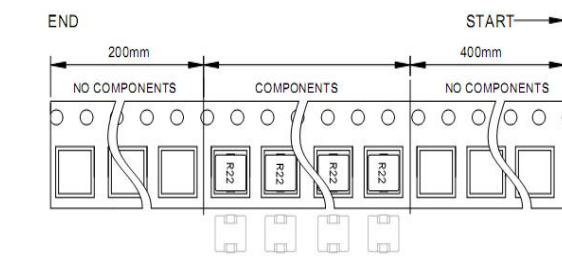
#### 5-1.1 Solder re-flow:

Recommended temperature profiles for re-flow soldering in Figure 1.

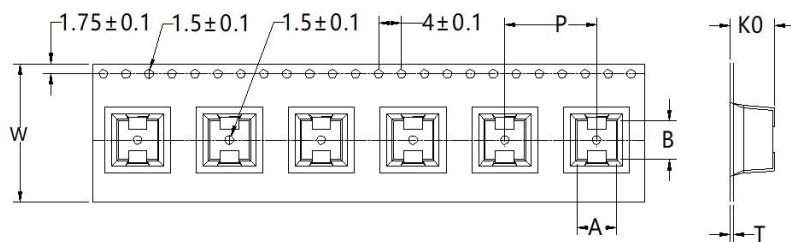


| Profile Feature                                       | Pb-Free Assembly                                                                                                                                                                |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Preheat/Soak</b>                                   |                                                                                                                                                                                 |
| Temperature Minimum ( $T_{Smin}$ )                    | 150°C                                                                                                                                                                           |
| Temperature Maximum ( $T_{Smax}$ )                    | 200°C                                                                                                                                                                           |
| Time ( $t_s$ ) from $T_{Smin}$ to $T_{Smax}$          | 60 – 120 seconds                                                                                                                                                                |
| Ramp-Up Rate ( $T_L$ to $T_P$ )                       | 3°C/second maximum                                                                                                                                                              |
| Liquidous Temperature ( $T_L$ )                       | 217°C                                                                                                                                                                           |
| Time Above Liquidous ( $t_L$ )                        | 60 – 150 seconds                                                                                                                                                                |
| Peak Temperature ( $T_P$ )                            | 260°C for A/CL5040420,050520, 050518, 050524<br>250°C for A/CL5050530, 050530, 050550,080830, 080840<br>245°C for A/CL5101040, 131335, 131350,131365, 171740,<br>171770, 221213 |
| Time within 5°C of Maximum Peak Temperature ( $t_P$ ) | 30 seconds maximum                                                                                                                                                              |
| Ramp-Down Rate ( $T_P$ to $T_L$ )                     | 6°C/second maximum                                                                                                                                                              |
| Time 25°C to Peak Temperature                         | 8 minutes maximum                                                                                                                                                               |

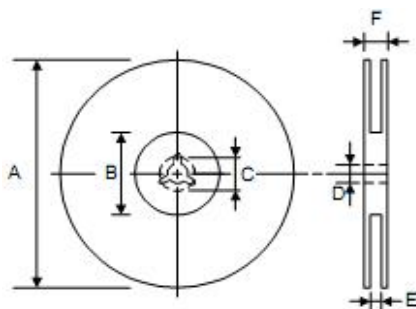
## 6. Packaging Information



The force for peeling off cover tape is 30 to 130 grams in the arrow direction.



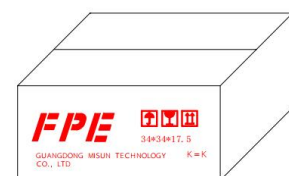
| A   | B    | W  | P | T    | K0  |
|-----|------|----|---|------|-----|
| 5.5 | 5.85 | 12 | 8 | 0.35 | 3.3 |



| A     | B     | C      | D    | E        | F      |
|-------|-------|--------|------|----------|--------|
| 330±2 | 100±2 | 20±0.5 | 13±1 | 12.5±0.5 | 16.5±2 |

### Packaging Quantity

| Chip size | Chip/Reel | Carton |
|-----------|-----------|--------|
| 0530 系列   | 2000      | 24000  |



### Application Notice

#### Storage Conditions

To maintain the solderability of terminal electrodes:

1. FPE products meet IPC/JEDEC J-STD-020D standard-MSL, level 1.
2. Temperature and humidity conditions: Less than 40°C and 60% RH.
3. Recommended products should be used within 12 months form the time of delivery.
4. The packaging material should be kept where no chlorine or sulfur exists in the air.

#### Transportation

1. Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
2. The use of tweezers or vacuum pick up is strongly recommended for individual components.
3. Bulk handling should ensure that abrasion and mechanical shock are minimized.

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