



| REVISION |                                                    |            |          |         |          |
|----------|----------------------------------------------------|------------|----------|---------|----------|
| REV      | DESCRIPTION                                        | DATE       | DESIGNED | CHECKED | APPROVED |
| A0       | 文件建立                                               | 2023/02/24 | 吕秀秀      | Bowen   | Darren   |
| A1       | 新增<br>R47/4R7/6R8 机种                               | 2023/03/04 | 吕秀秀      | Bowen   | Darren   |
| A2       | 新增 R33 机种                                          | 2023/08/14 | 吕秀秀      | Bowen   | Darren   |
| A3       | 新增 R22,R68 机种                                      | 2025/07/14 | Kalyn    | Bowen   | Darren   |
| A4       | 新增 R10,R40,R60,<br>1R5,5R6,8R2 机种和增<br>加 Reflow 曲线 | 2025/08/29 | Kalyn    | Wangkai | Darren   |
|          |                                                    |            |          |         |          |
|          |                                                    |            |          |         |          |
|          |                                                    |            |          |         |          |
|          |                                                    |            |          |         |          |

## High Current, Power Inductors

### VCMC-0421-XXX-M-6A Power Choke



#### Description

- Halogen Free AEC-Q200 qualified & Automotive applications
- 165°C maximum total temperature operation
- 4.50x4.30x2.1mm maximum surface mount package
- Magnetically shielded, low EMI
- High current carrying capacity, Low core losses
- RoHS compliant

#### Applications

- Automotive applications

#### Environmental Data

- Storage temperature range: -55°C to +165°C
- Operating temperature range: -55°C to +165°C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020 compliant

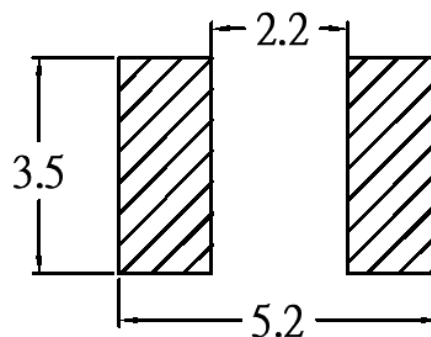
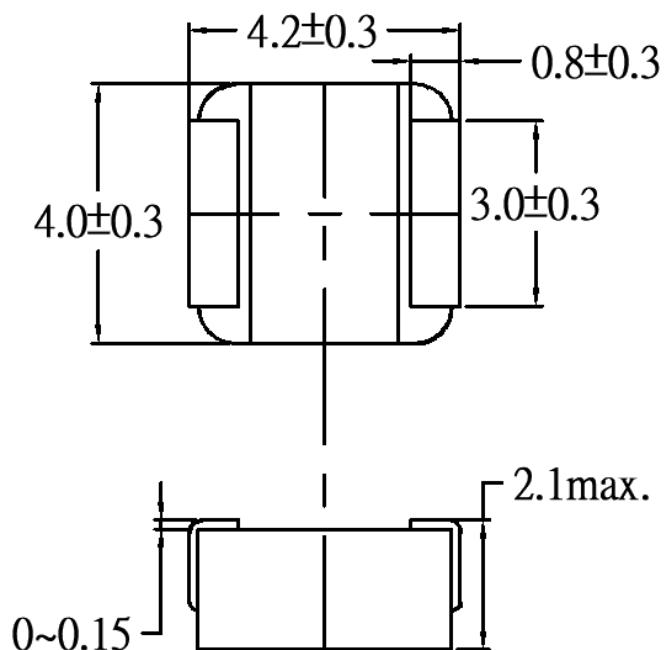
| Description        |   |   |   |                  |   |   |   |                      |   |   |   |           |       |
|--------------------|---|---|---|------------------|---|---|---|----------------------|---|---|---|-----------|-------|
| VCMC-0421-1R0-M-6A |   |   |   | 1.0μH            |   |   |   | ± 20%                |   |   |   |           |       |
| Model              |   |   |   | Inductance Value |   |   |   | Inductance Tolerance |   |   |   |           |       |
| Global Part Number |   |   |   |                  |   |   |   |                      |   |   |   |           |       |
| V                  | C | M | C | 0                | 4 | 2 | 1 | 1                    | R | 0 | M | 6A        |       |
| Product Series     |   |   |   | Dimensions       |   |   |   | Inductance Value     |   |   |   | Tolerance | 165°C |

| Part No.           | Inductance          | DC Resistance |       | Heating Rating<br>Current |      | Saturation<br>Current |      |
|--------------------|---------------------|---------------|-------|---------------------------|------|-----------------------|------|
|                    | L0 (μH)             | DCR (mΩ)      |       | Idc (A)                   |      | Isat (A)              |      |
|                    | ± 20%, 100kHz, 1.0V | TYP.          | MAX.  | TYP.                      | MAX. | TYP.                  | MAX. |
| VCMC-0421-R10-M-6A | 0.10                | 1.90          | 2.28  | 21.0                      | 18.9 | 25.0                  | 21.4 |
| VCMC-0421-R22-M-6A | 0.22                | 5.3           | 6.4   | 11.4                      | 10.3 | 13.7                  | 11.7 |
| VCMC-0421-R33-M-6A | 0.33                | 5.8           | 7.0   | 10.9                      | 9.8  | 13.5                  | 11.5 |
| VCMC-0421-R40-M-6A | 0.40                | 6.0           | 7.2   | 10.7                      | 9.6  | 12.6                  | 10.8 |
| VCMC-0421-R47-M-6A | 0.47                | 6.3           | 7.6   | 10.6                      | 9.5  | 10.9                  | 9.4  |
| VCMC-0421-R60-M-6A | 0.60                | 8.1           | 9.3   | 12.1                      | 10.9 | 10.4                  | 8.9  |
| VCMC-0421-R68-M-6A | 0.68                | 8.6           | 10.3  | 9.1                       | 8.2  | 9.5                   | 8.1  |
| VCMC-0421-1R0-M-6A | 1.0                 | 9.1           | 10.5  | 8.9                       | 8.0  | 7.9                   | 6.7  |
| VCMC-0421-1R5-M-6A | 1.5                 | 13.4          | 15.4  | 7.3                       | 6.5  | 6.2                   | 5.3  |
| VCMC-0421-2R2-M-6A | 2.2                 | 20.9          | 23.0  | 5.8                       | 5.3  | 5.3                   | 4.5  |
| VCMC-0421-3R3-M-6A | 3.3                 | 33.4          | 36.8  | 4.6                       | 4.1  | 4.0                   | 3.4  |
| VCMC-0421-4R7-M-6A | 4.7                 | 48.6          | 53.8  | 4.0                       | 3.6  | 3.7                   | 3.2  |
| VCMC-0421-5R6-M-6A | 5.6                 | 61.8          | 71.1  | 3.4                       | 3.0  | 2.9                   | 2.5  |
| VCMC-0421-6R8-M-6A | 6.8                 | 80.5          | 92.5  | 2.9                       | 2.6  | 2.6                   | 2.2  |
| VCMC-0421-8R2-M-6A | 8.2                 | 103.0         | 118.5 | 2.6                       | 2.3  | 2.5                   | 2.1  |
| VCMC-0421-100-M-6A | 10.0                | 112.0         | 129.0 | 2.5                       | 2.2  | 2.4                   | 2.0  |

**Notes**

1. All test data is referenced to 25 °C ambient
2. Operating temperature range - 55 °C to + 165°C
3. Idc(A):DC current (A) that will cause an approximate ΔT of 40°C (reference ambient temperature is 25°C)
4. Isat(A):DC current (A) that will cause L0 to drop approximately 30%
5. The part temperature (ambient + temp rise) should not exceed 165°C 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.

• Dimensions-mm



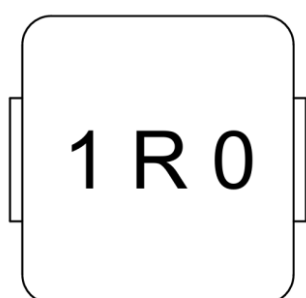
Recommend Land Pattern Dimensions

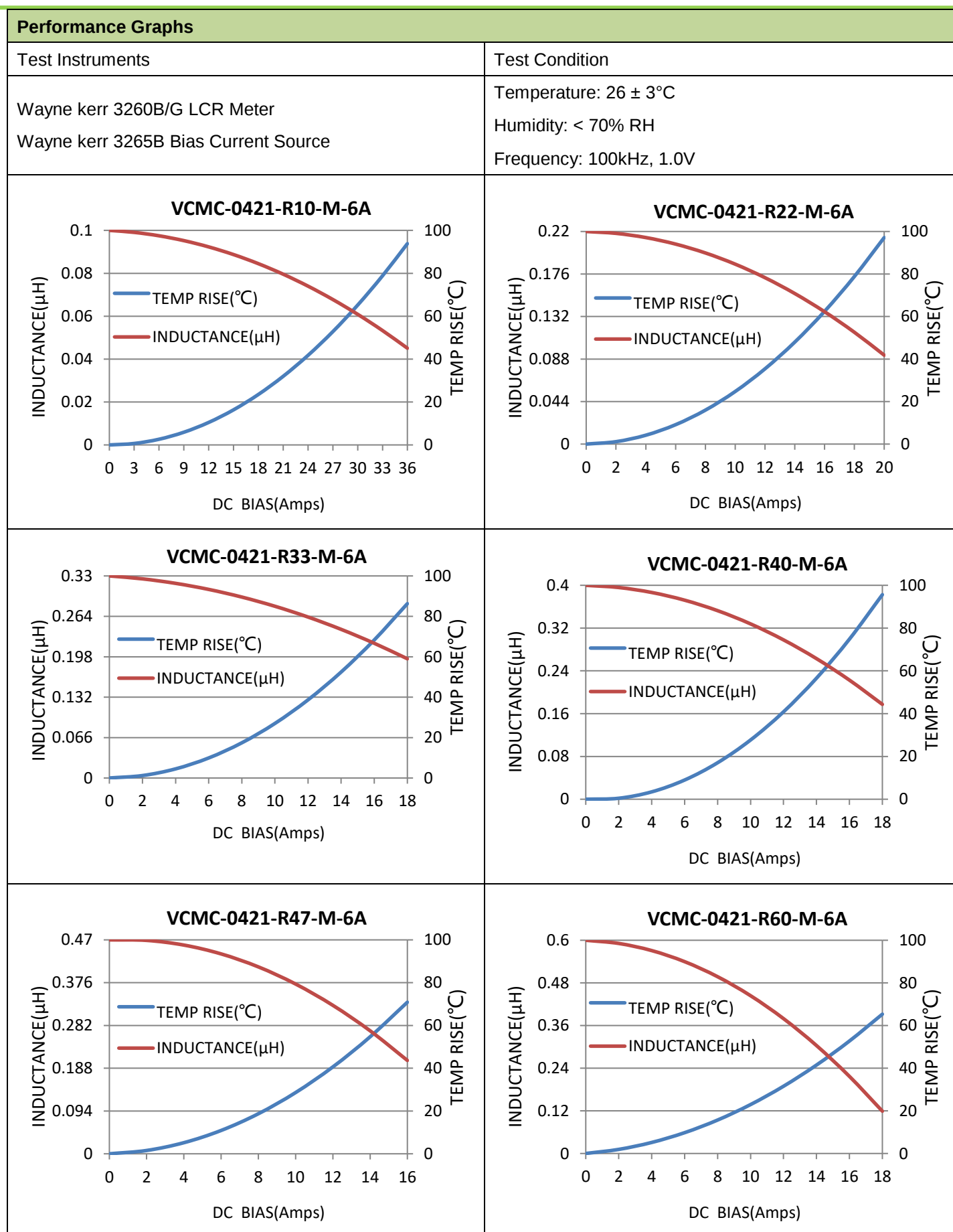
• Marking

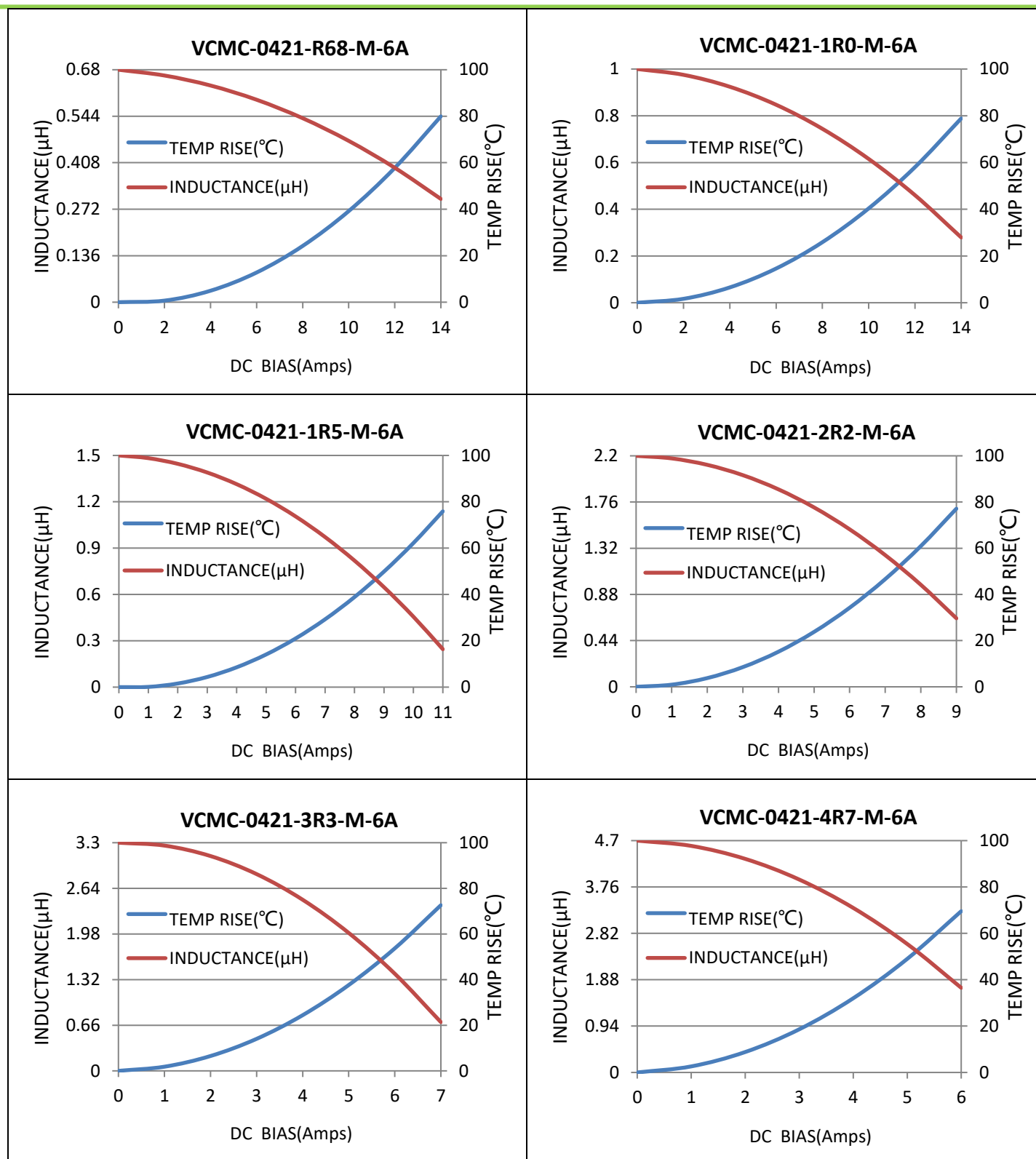
The inductor is marked with a 3-digit code

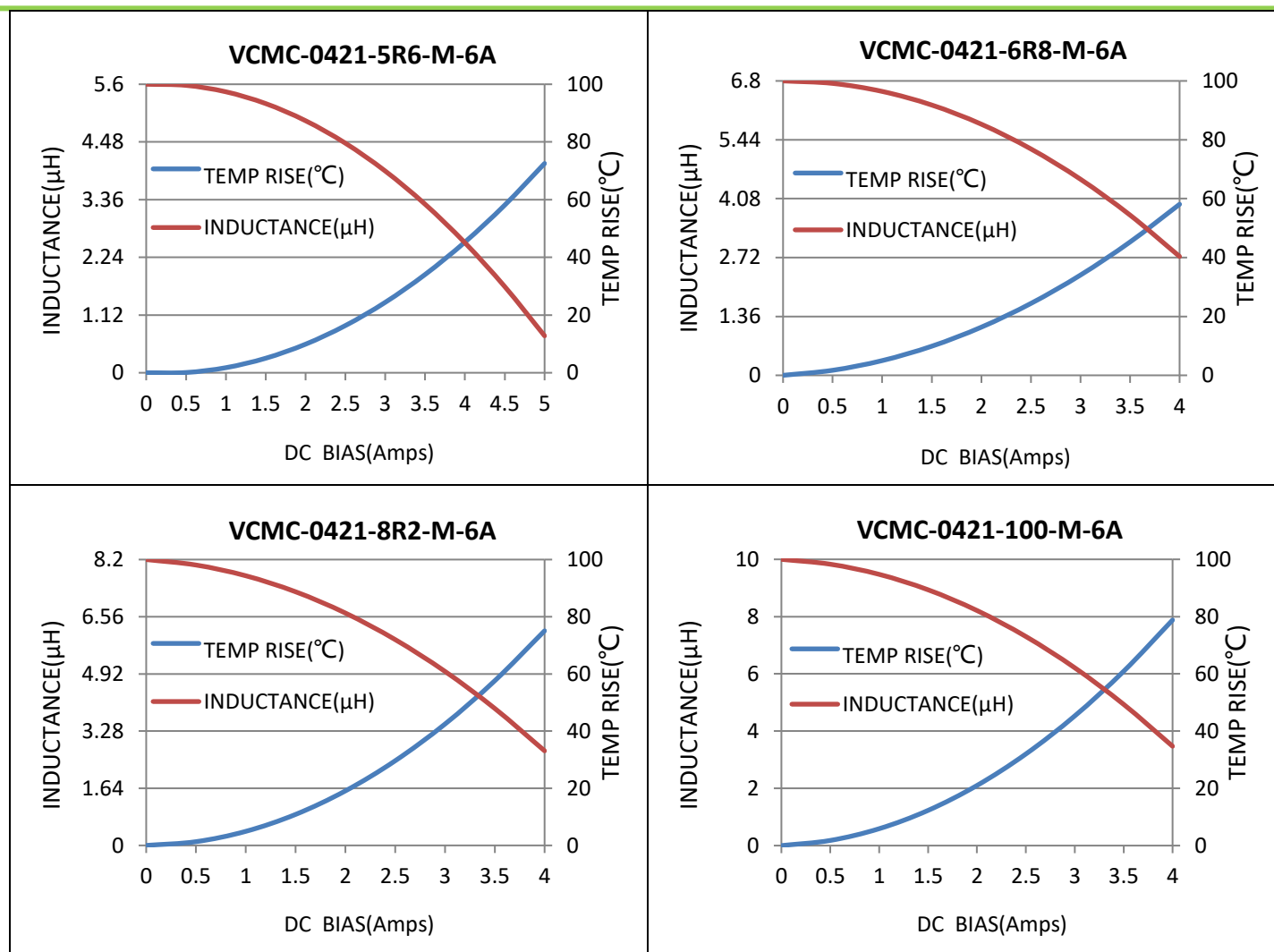
Example - -1.0→1R0

Note : Using Ink for marking

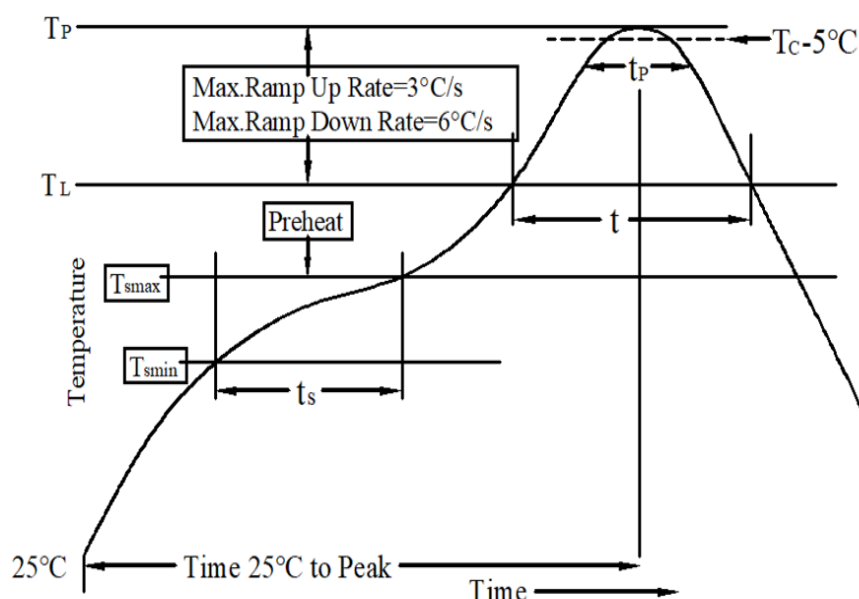








## • Solder Reflow Profile


Table 1-Standard SnPb Solder( $T_C$ )

| Package Thickness | Volume mm <sup>3</sup> | Volume mm <sup>3</sup> |
|-------------------|------------------------|------------------------|
|                   | <350                   | <350                   |
| <2.5mm            | 235°C                  | 220°C                  |
| ≥2.5mm            | 220°C                  | 220°C                  |

Table 2-Lead(Pb) Free Solder( $T_C$ )

| Package Thickness | Volume mm <sup>3</sup> | Volume mm <sup>3</sup> | Volume mm <sup>3</sup> |
|-------------------|------------------------|------------------------|------------------------|
|                   | <350                   | 350-2000               | >2000                  |
| <1.6mm            | 260°C                  | 260°C                  | 260°C                  |
| 1.6-2.5mm         | 260°C                  | 250°C                  | 245°C                  |
| >2.5mm            | 250°C                  | 245°C                  | 245°C                  |

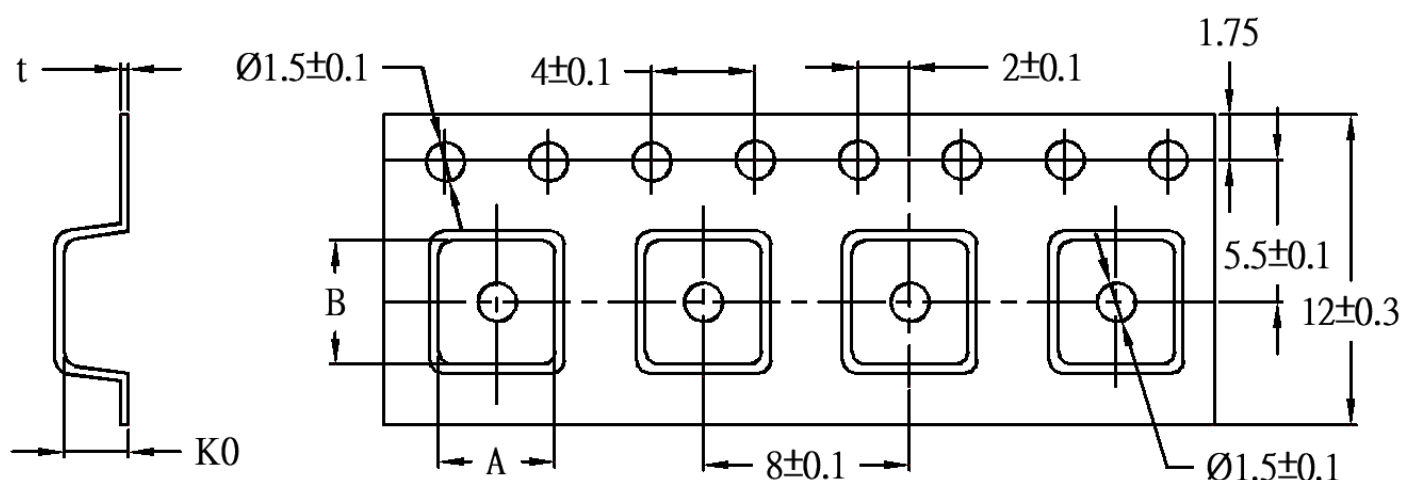
## Reference JDEC J-STD-020

| Profile Feature                                                                   | Standard SnPb Solder | Lead (Pb) Free Solder |
|-----------------------------------------------------------------------------------|----------------------|-----------------------|
| Preheat and Soak                                                                  |                      |                       |
| • Temperature min. ( $T_{smin}$ )                                                 | 100°C                | 150°C                 |
| • Temperature max. ( $T_{smax}$ )                                                 | 150°C                | 200°C                 |
| • Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )                                     | 60-120 Seconds       | 60-120 Seconds        |
| Average ramp up rate $T_{smax}$ to $T_P$                                          | 3°C/Second Max.      | 3°C/Second Max.       |
| Liquidous temperature ( $T_L$ )                                                   | 183°C                | 217°C                 |
| Time at liquidous ( $t_L$ )                                                       | 60-150 Seconds       | 60-150 Seconds        |
| Peak package body temperature ( $T_P$ )*                                          | Table 1              | Table 2               |
| Time ( $t_p$ )** within 5°C of the specified classification temperature ( $T_C$ ) | 20 Seconds**         | 30 Seconds**          |
| Average ramp-down rate ( $T_P$ to $T_{smax}$ )                                    | 6°C/Second Max.      | 6°C/Second Max.       |
| Time 25°C to Peak Temperature                                                     | 6 Minutes Max.       | 8 Minutes Max.        |

\* Tolerance for peak profile temperature ( $T_P$ ) is defined as a supplier minimum and a user maximum.

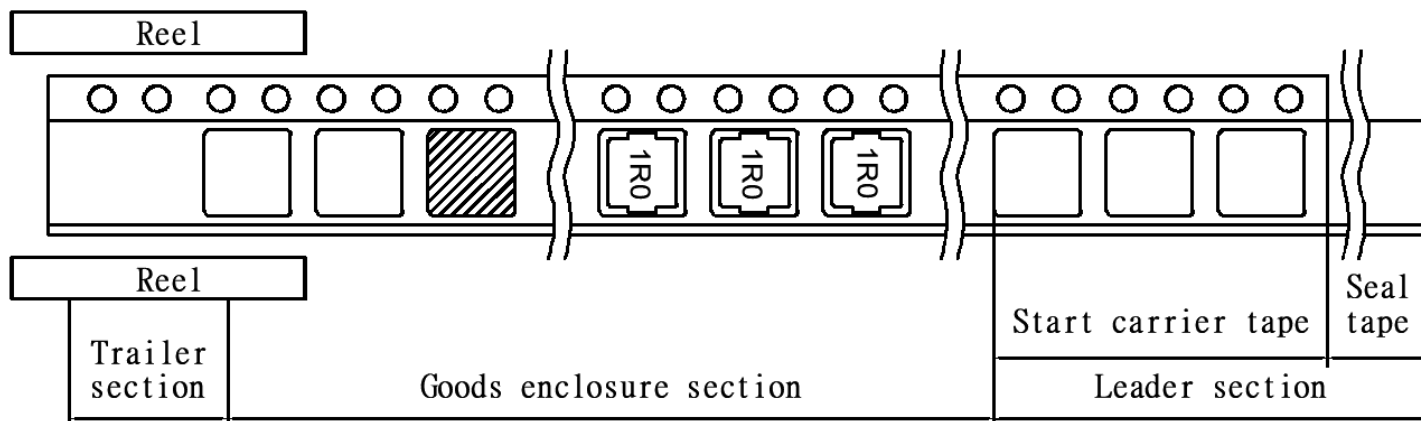
\*\* Tolerance for time at peak profile temperature ( $t_p$ ) is defined as a supplier minimum and a user maximum.

## Tape Packaging Dimensions-mm



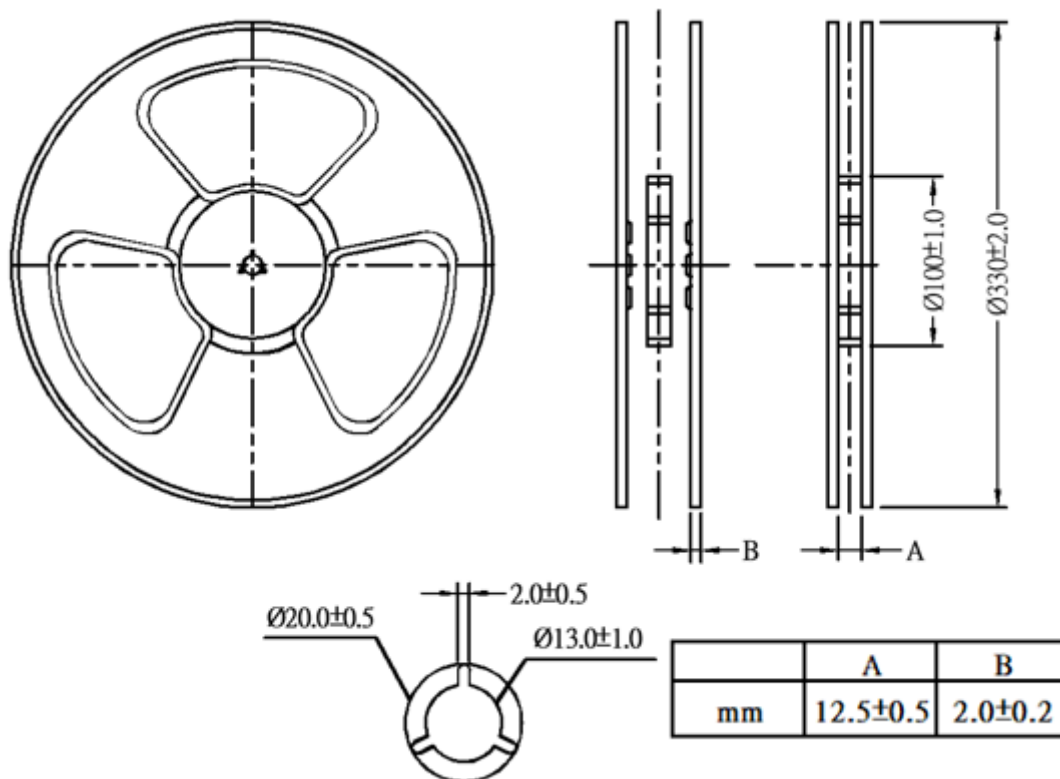
| A0      | B0      | K0       | t         |
|---------|---------|----------|-----------|
| 4.5±0.1 | 4.8±0.1 | 2.5±0.15 | 0.35±0.05 |

## Taping dimension and tape direction, Leader, Trailer, section dimension



|                         |           |
|-------------------------|-----------|
| Leader section          | Min.400mm |
| Carrier tape start size | Min.100mm |
| Trailer section size    | Min.160mm |

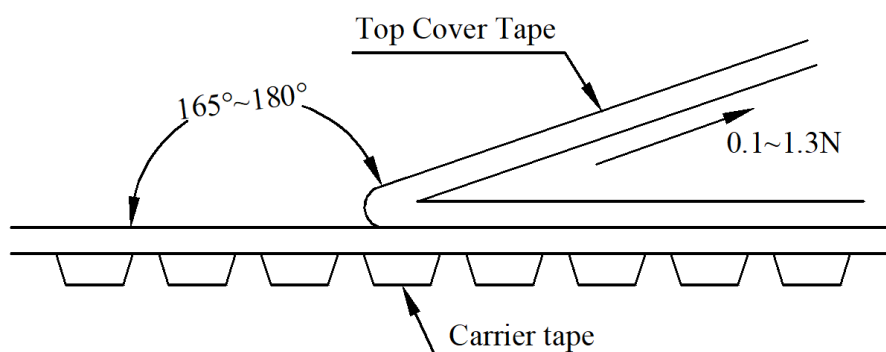
## Reel Dimensions-mm



## • 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

3000pieces/reel