# 深圳市佑驰电子有限公司

## Specification for Approval

产品名称: 一体系列电感

规格型号: HCTC-4012-XXX-M-D

产品编号:

日　　期: 2020-08-15

1、本承认书的内容更改需经过双方确认，任一方单独的修改均视为无效。

2、本承认书在送达客户后，请给予承认并即签回， 如无签 回下订单 的， 我司有权以此承认　书标准生产， 并表示购买方默认许可。

| | 审核 | 制作 |
|---|---|---|
| | | |

| 批准 | 申核 | 检验 |
|---|---|---|
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| REVISION | | | | | |
|---|---|---|---|---|---|
| REV | DESCRIPTION | DATE | DESIGNED | CHECKED | APPROVED |
| A0 | 文件建立 | 2020/08/15 | 吕秀秀 | Bowen | Darren |
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# High Current, Power Inductors

## HCTC-4012-XXX-M-D PowerChoke

### Description

- Halogen Free
- 125°C maximum total temperature operation
- 4.30 x 4.30x 1.2mm maximum surface mount package
- Powder iron core material
- Magnetically shielded, low EMI
- High current carrying capacity, Low core losses
- RoHS compliant

### Applications

- Voltage Regulator Module (VRM)
- Multi-phase regulators
- Point-of-load modules
- Smart phone POL modules
- SSD modules
- Notebook regulators
- Battery power systems
- Graphics cards
- Data networking and storage systems

### Environmental Data

- Storage temperature range: -55°C to +125 °C
- Operating temperature range: -55°C to +125°C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant

| Description | | |
|---|---|---|
| HCTC-4012-3R3-M-D<br>Model | 3.3μH<br>Inductance Value | ±20 %<br>Inductance Tolerance |

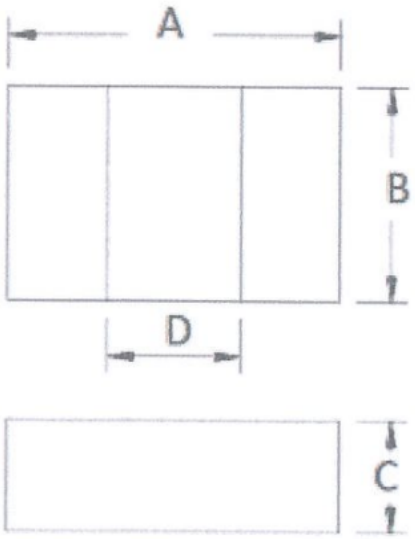
| Global Part Number | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| H | C | T | C | 4 | 0 | 1 | 2 | 3 | R | 3 | M | D |
| Product Series | | | | Dimensions | | | | Inductance | | | Value Tol. | Code |

| PartNo. | Inductance | DCResistance | | HeatingRatingCurrent | | SaturationCurrent | |
|---|---|---|---|---|---|---|---|
| | L0(μH) | DCR(mΩ) | | Idc(A) | | Isat(A) | |
| | ±20%,1MHz,1V | TYP. | MAX. | TYP. | MAX. | TYP. | MAX. |
| HCTC-4012-3R3-M-D | 3.3 | 46 | 52 | 5.0 | 4.6 | 4.8 | 4.2 |
| HCTC-4012-4R7-M-D | 4.7 | 63 | 72 | 4.5 | 4.0 | 3.6 | 3.2 |
| HCTC-4012-6R8-M-D | 6.8 | 88 | 100 | 4.0 | 3.5 | 3.2 | 2.8 |

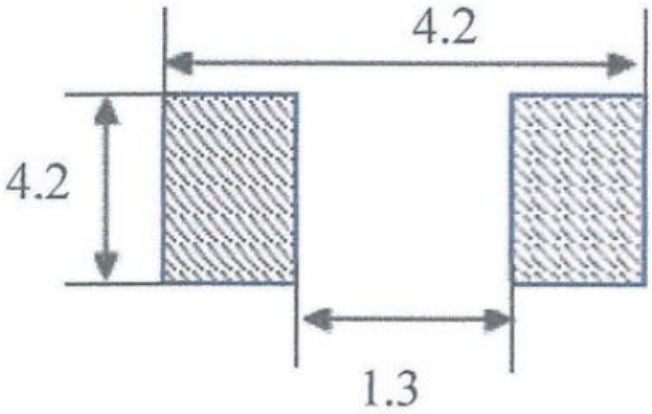
**Notes**

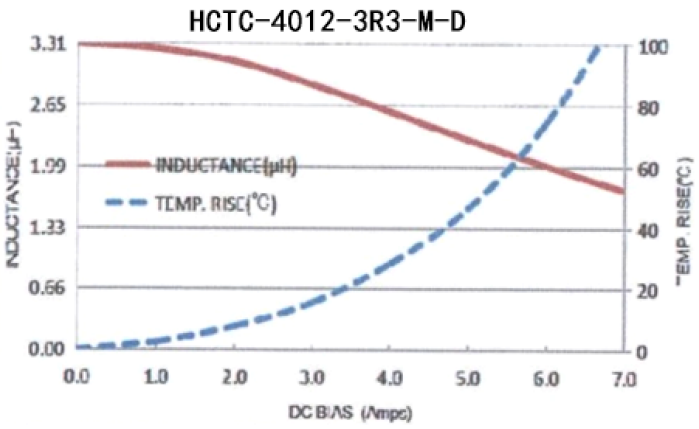
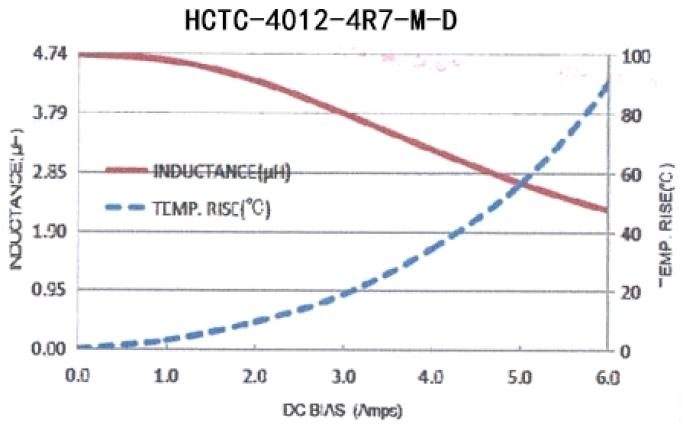
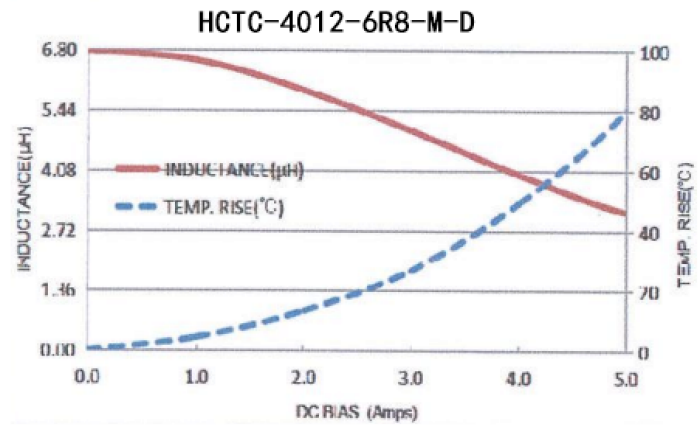
1.All test data is referenced to 23±3℃ and 45%RH to 70%RH ambient.
2.Test Instruments:1MHz,1V.
3.Operating temperature range -55C to +125℃(ambient +self-temp.rise)
4.Isat:DC current(A)that will cause Lo to drop approximately 30%.
5.Idc:DC current(A)that will cause an approximate △T of 40C.
6.The part temperature(ambient +temp.rise)should not exceed 125°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.
7.The rated current as listed is either the saturation current or the heat rating current depending on which value is lower.

**•Dimensions-mm**



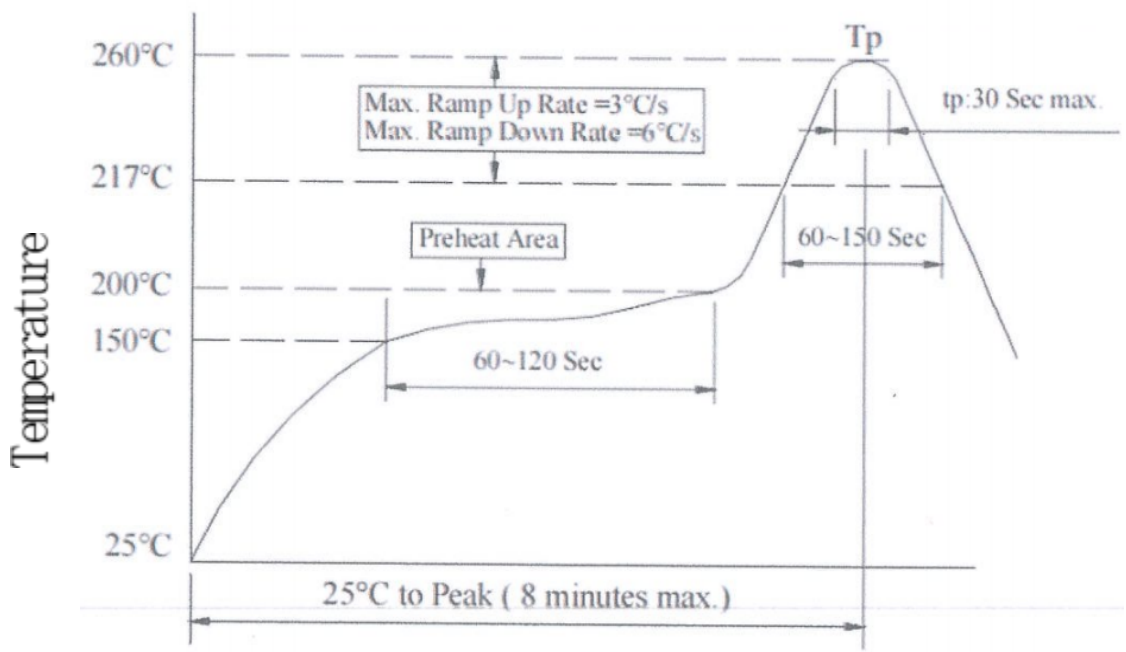

| | |
|---|---|
| A | 4.1±0.2 |
| B | 4.1±0.2 |
| C | 1.2 Max. |
| D | 1.7Typ. |



| Performance Graphs | |
|---|---|
| Test Instruments | Test Condition |
| Wayne kerr 3260B/G LCR Meter<br>Wayne kerr 3265B Bias Current Source | Temperature: 26 ±3℃<br>Humidity: < 70% RH<br>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. Preheating: 160 ± 10 ℃<br>2. Retention time: 245 ± 5 ℃ for 2 ± 0.5 seconds |
| Vibration | Inductance change: Within ± 10%<br>Without mechanical damage such as break | 1. Vibration frequency:<br>(10 Hz to 55 Hz to 10Hz) in 60 seconds as a period<br>2. Vibration time:<br>Period cycled for 2 hours in each of 3 mutual perpendicular directions.<br>3. Amplitude: 1.5 mm max. |
| Shock | Inductance change: Within ± 10%<br>Without mechanical damage such as break | 1. Peak value: 100 G<br>2. Duration of pulse: 11ms<br>3. 3 times in each positive and negative direction of 3 mutual perpendicular directions |
| Endurance Reliability | | |
| Item | Specification and Requirement | Test Method |
| Thermal Shock | Inductance change: Within ± 10%<br>Without distinct damage in appearance | 1. Repeat 100 cycles as follow:<br>(-55 ± 2 ℃; 30 ± 3 min)<br>→(Room temp., 5 min)<br>→ (+125 ± 2 ℃, 30 ± 3 min)<br>→ (Room temp., 5 min)<br>2. Recovery: 48 + 4 / -0 hours of recovery under the standard condition after the test. |
| High Temperature Resistance | Inductance change: Within ± 10%<br>Without distinct damage in appearance | 1. Environment condition: 85 ± 2 ℃<br>Applied Current: Rated current<br>2. Duration: 1000 + 4 / -0 hours |
| Humidity Resistance | Inductance change: Within ± 10%<br>Without distinct damage in appearance | 1. Environment condition: 60 ± 2 ℃<br>Humidity: 90-95%<br>Applied Current: Rated current<br>2. Duration: 1000 + 4 / -0 hours |
| Low Temperature Store | Inductance change: Within ± 10%<br>Without distinct damage in appearance | Store temperature:<br>-55 ± 2 ℃, 1000 + 4 / -0 hours |
| High Temperature Store | Inductance change: Within ± 10%<br>Without distinct damage in appearance | Store temperature:<br>+125 ± 2 ℃, 1000 + 4 / -0 hours |

## Reflow Profile:




●Reflow Soldering Method:

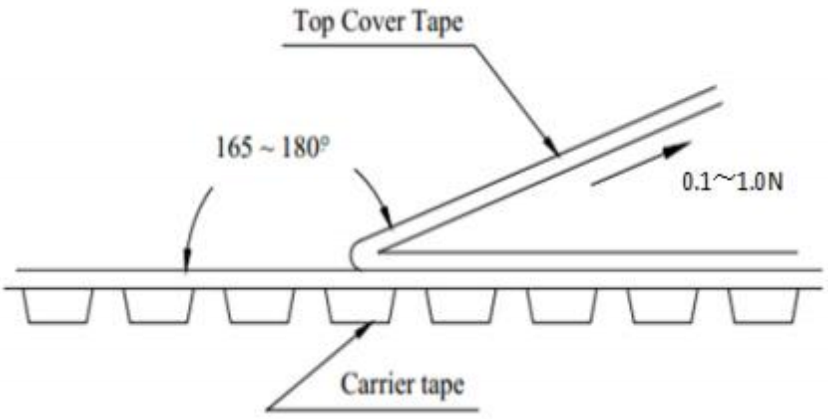
| | | |
|---|---|---|
| Reflow Soldering | Tp:255~260℃ | Max. 30 seconds(tp) |
| | 217℃ | 60~150 seconds |
| Pre-Heat | 150～200℃ | 60~120 seconds |
| Time 25℃ to peak temperature | 8 minutes max. | |

●Soldering iron Method:350±5℃ max.3 second

• 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 1.0N




## Numbers of taping:

● 3,000 pieces/reel

## Label marking:

● The following items shall be marked on the production and shipping
● Label on the reel

## Production Label

√ Part No.
√ Description
√ Quantity
√ Produce No.

## Care note for use:

Storage Condition: Temperature 25 to 35℃,Humidity 45 to 75%RH

Use Temperature:

√ Minimum Temperature:-55℃Ambient temperature of molded power inductor
√ Maximum Temperature:+125℃ The value of temperature including ambient of the transformer and temperature rise of molded power inductor.
√ There is not a problem from-55℃~+125℃ in a reliability test.
√ However,this is not meant a temperature grade guarantee of UL.

Model :When this molded power inductor was used in a similar or new product to the original one,sometimes it might be unable to satisfy the specifications due to difference of condition of usage.

Drop:If the molded power inductor suffered mechanical stress such as drop, characteristics may become poor (due to damage on coil bobbin,etc.).Never use such stressed molded power inductor.