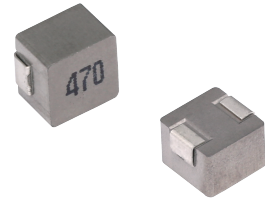


MCMB-0520 Series

High Current Molded Power Inductors

FEATURES

- Powder iron core material
- Magnetically shielded, low EMI
- High current carrying capacity, Low core losses
- Frequency range up to 3MHz
- Operate temperature range $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$ (Including self temp. rise)
- RoHS compliant



APPLICATIONS

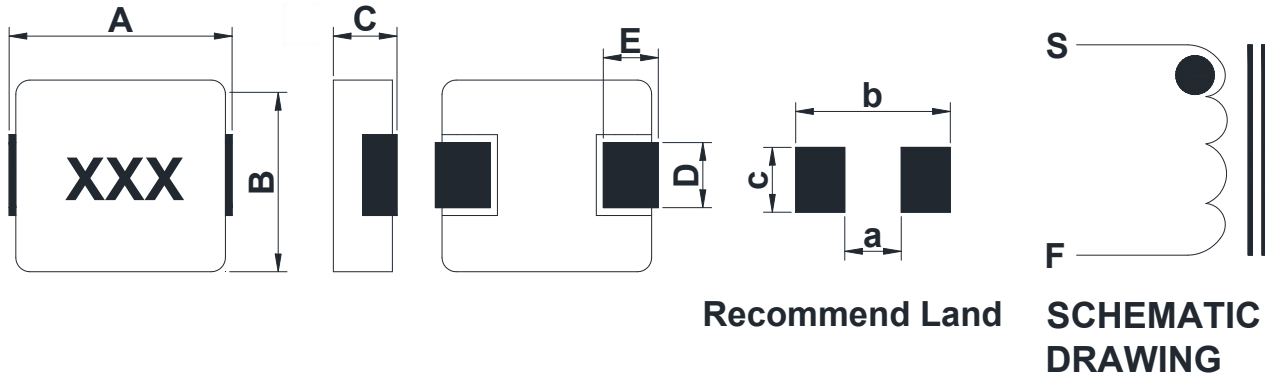
- Voltage Regulator Module (VRM)
- Multi-phase regulators
- Point-of-load modules
- Smart phone POL modules
- SSD modules
- Notebook regulators
- Battery power systems
- Graphics cards
- Data networking and storage systems

Explanation of Part Number

MCMB -0520 -1R0 M T

1 2 3 4 5

- ◆ 1:Product Series: Metal Alloy Molding Power Inductor
- ◆ 2:Dimensions:
- ◆ 3: Initial inductance value: 1R0 = 1.0uH
- ◆ 4:Tolerance of Inductance:M: $\pm 20\%$
- ◆ 5.Packing:Tape Carrier Package

Dimensions: [mm]


| series | A | B | C | D | E | a (typ) | b (typ) | c (typ) |
|-----------|-----------|-----------|----------|-----------|-----------|---------|---------|---------|
| MCMB-0520 | 5.40±0.30 | 5.20±0.20 | 2.00 MAX | 2.20±0.50 | 1.20±0.50 | 2.20 | 6.00 | 2.70 |

Electrical Properties:

| Part No. | Inductance | DC Resistance | | Heating Rating Current | Saturation Current |
|-----------------|--------------------|---------------|-------|------------------------|--------------------|
| | L0 (μH) | DCR (mΩ) | | Idc (A) | Isat (A) |
| | ±20 %, 100 kHz, 1V | TYP. | MAX. | TYP. | TYP. |
| MCMB-0520-R22MT | 0.22 | 4.0 | 4.5 | 15 | 19 |
| MCMB-0520-R33MT | 0.33 | 6.7 | 8.2 | 14 | 18 |
| MCMB-0520-R47MT | 0.47 | 8.2 | 9.0 | 10.5 | 15.5 |
| MCMB-0520-R56MT | 0.56 | 8.5 | 10.5 | 9.5 | 15 |
| MCMB-0520-1R0MT | 1.0 | 16.5 | 17.0 | 8.0 | 9.0 |
| MCMB-0520-1R5MT | 1.5 | 23.5 | 26.0 | 7.5 | 9.0 |
| MCMB-0520-2R2MT | 2.2 | 32.0 | 35.0 | 6.5 | 5.5 |
| MCMB-0520-3R3MT | 3.3 | 47.0 | 58.0 | 4.5 | 5.0 |
| MCMB-0520-4R7MT | 4.7 | 73.0 | 85.0 | 3.5 | 4.0 |
| MCMB-0520-6R8MT | 6.8 | 110.0 | 120.0 | 2.7 | 3.4 |
| MCMB-0520-100MT | 10.0 | 132.0 | 155.0 | 2.5 | 3.0 |

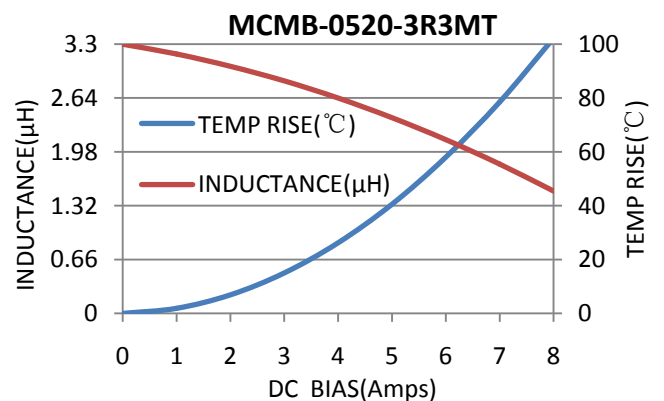
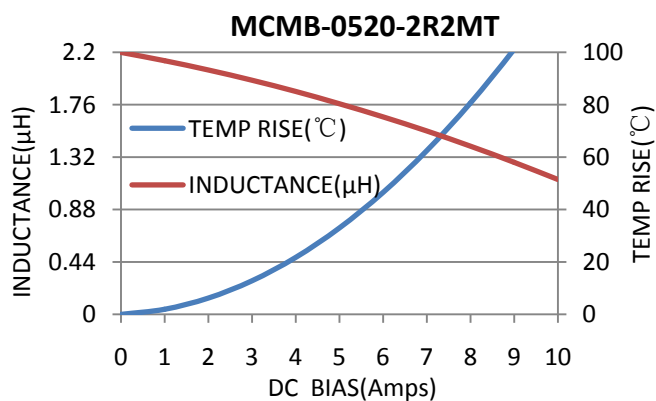
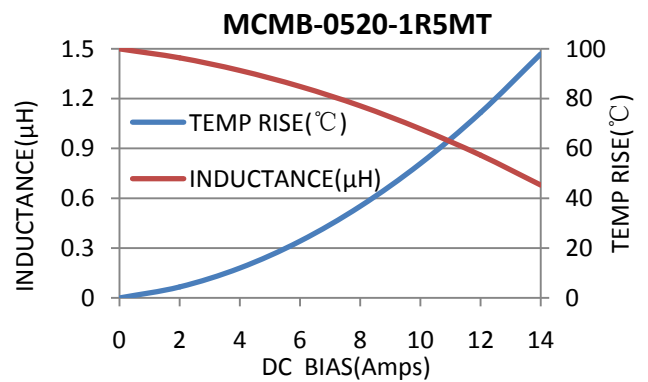
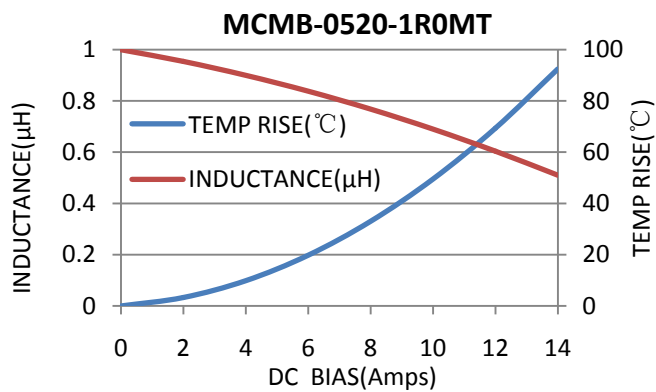
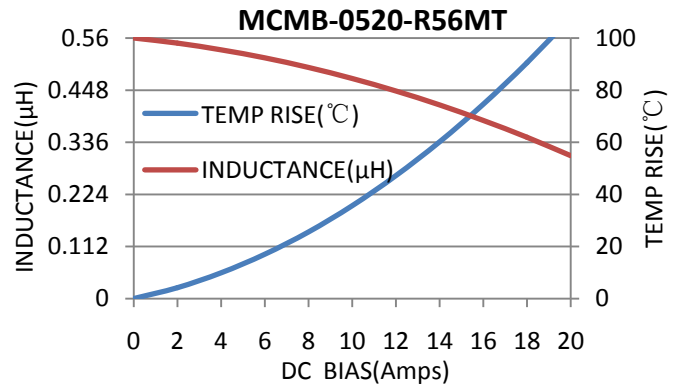
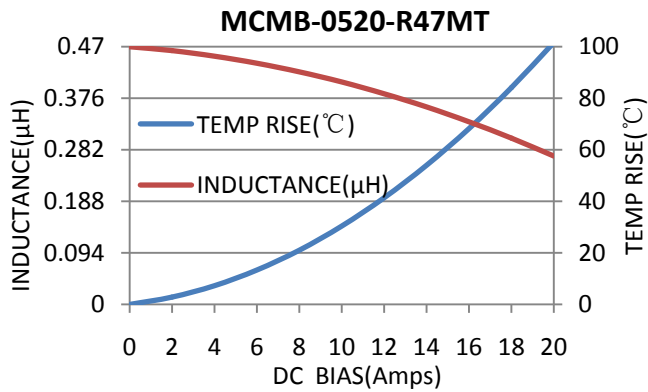
Notes

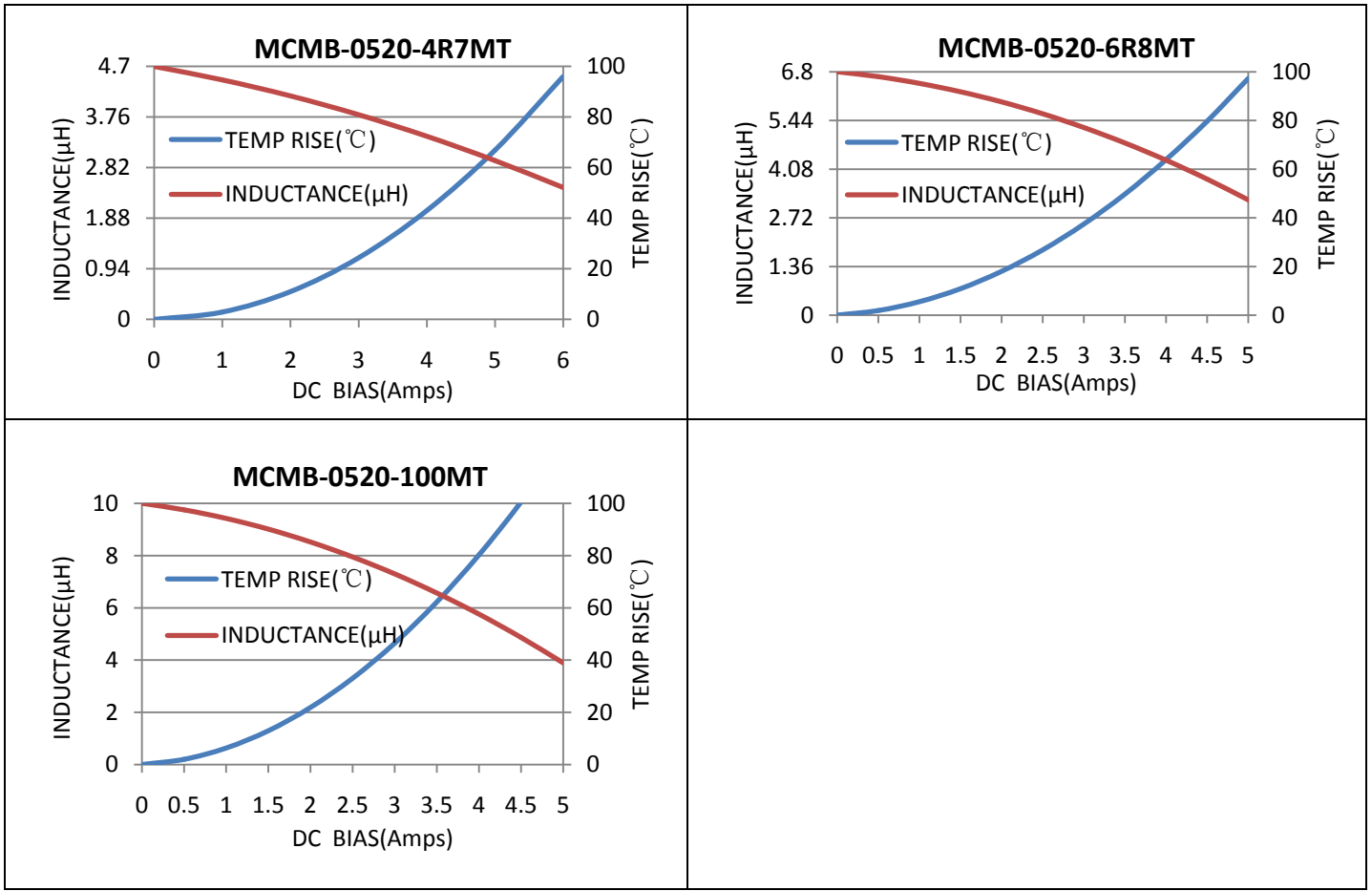
1. All test data is referenced to 25 °C ambient
2. Idc(A):DC current (A) that will cause an approximate ΔT of 40 °C(reference ambient temperature is 25°C)
3. Isat(A):DC current (A) that will cause L0 to drop approximately 30%
4. The part temperature (ambient + temp rise) should not exceed 125 °C under 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.
5. Absolute maximum voltage 30V

Performance Graphs
Test Instruments

 Wayne kerr 3260B/G LCR Meter
 Wayne kerr 3265B Bias Current Source

Test Condition

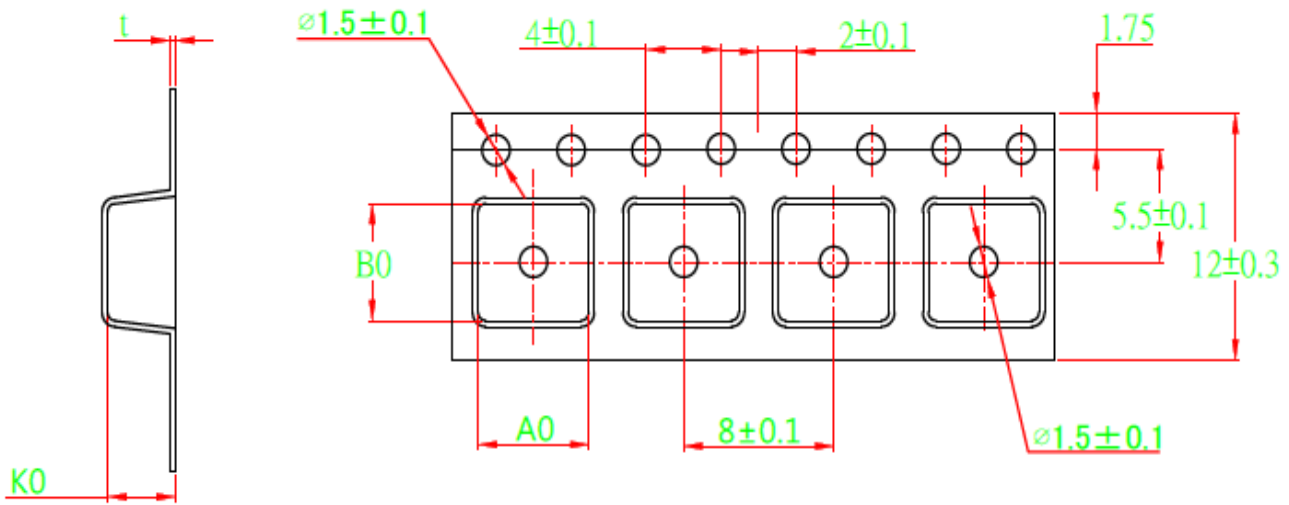
 Temperature: $26 \pm 3^{\circ}\text{C}$
 Humidity: $< 70\% \text{ RH}$
 Frequency: 100 KHz, 1.0V




Reliability and Test Condition

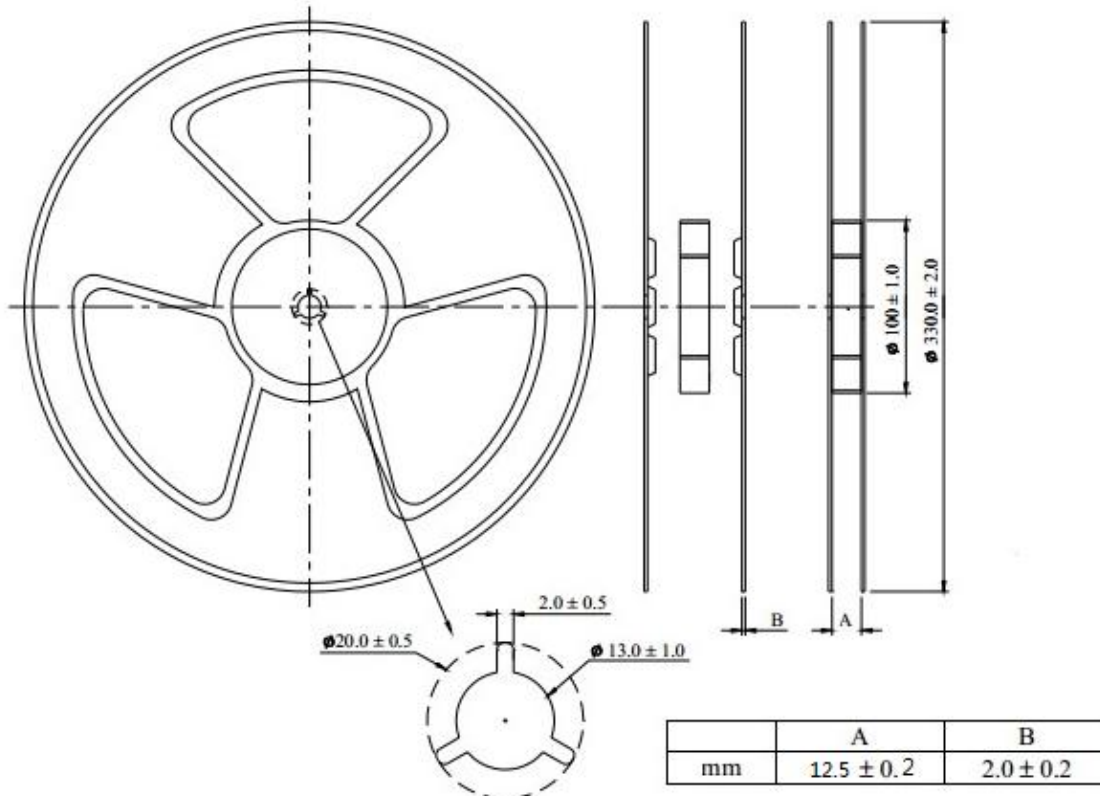
| Mechanical Reliability | | |
|-----------------------------|---|---|
| Item | Specification and Requirement | Test Method |
| Solderability | The surface of terminal immersed shall be minimum of 95% covered with a new coating of solder | Solder heat proof: 1. Preheating: 160 ± 10 °C 2. Retention time: 245 ± 5 °C for 2 ± 0.5 seconds |
| Vibration | Inductance change: Within $\pm 10\%$ Without mechanical damage such as break | 1. Vibration frequency: (10 Hz to 55 Hz to 10Hz) in 60 seconds as a period 2. Vibration time: Period cycled for 2 hours in each of 3 mutual perpendicular directions. 3. Amplitude: 1.5 mm max. |
| Shock | Inductance change: Within $\pm 10\%$ Without mechanical damage such as break | 1. Peak value: 100 G 2. Duration of pulse: 11ms 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 $\pm 10\%$ Without distinct damage in appearance | 1. Repeat 100 cycles as follow: (-55 ± 2 °C; 30 ± 3 min) → (Room temp., 5 min) → ($+125 \pm 2$ °C, 30 ± 3 min) → (Room temp., 5 min) 2. Recovery: $48 + 4 / -0$ hours of recovery under the standard condition after the test. |
| High Temperature Resistance | Inductance change: Within $\pm 10\%$ Without distinct damage in appearance | 1. Environment condition: 85 ± 2 °C Applied Current: Rated current 2. Duration: $1000 + 4 / -0$ hours |
| Humidity Resistance | Inductance change: Within $\pm 10\%$ Without distinct damage in appearance | 1. Environment condition: 60 ± 2 °C Humidity: 90–95% Applied Current: Rated current 2. Duration: $1000 + 4 / -0$ hours |
| Low Temperature Store | Inductance change: Within $\pm 10\%$ Without distinct damage in appearance | Store temperature: -55 ± 2 °C, $1000 + 4 / -0$ hours |
| High Temperature Store | Inductance change: Within $\pm 10\%$ Without distinct damage in appearance | Store temperature: $+125 \pm 2$ °C, $1000 + 4 / -0$ hours |

Tape Packaging Dimensions



| A0 | B0 | K0 | t |
|----------------|----------------|----------------|-----------------|
| 5.7 ± 0.10 | 5.9 ± 0.10 | 2.3 ± 0.15 | 0.35 ± 0.05 |

Reel Dimensions



Packing Quantity: 2000pcs/Reel

Recommendable reflow soldering

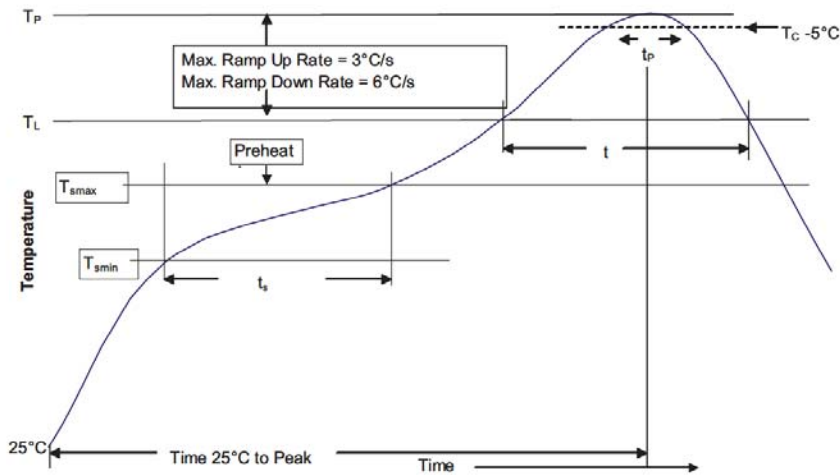


Table 1 - Standard SnPb Solder (T_C)

| Package Thickness | Volume mm^3 <350 | Volume mm^3 \geq 350 |
|-------------------|---------------------------|---------------------------------|
| <2.5mm | 235°C | 220°C |
| \geq 2.5mm | 220°C | 220°C |

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

| Package Thickness | Volume mm^3 <350 | Volume mm^3 350 - 2000 | Volume mm^3 >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.

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