Coiltronics HCMA1707 Series

Automotive grade
High current power inductors

Product description

- AEC-Q200 grade 3 qualified
- High current carrying capacity
- Magnetically shielded, low EMI
- Frequency range up to 1MHz
- Inductance range from 1.5µH to 68.0µH
- Current range from 5.2 to 40.0 amps
- 17.5x17.2mm footprint surface mount package in a 7.0mm height
- Powder iron core material
- Halogen free, lead free, RoHS compliant

Applications

- Body electronics
  - Central body control module
  - Headlamps, tail lamps and interior lighting
  - Heating Ventilation and Air Conditioning controllers (HVAC)
  - Doors, window lift and seat control
- Advanced driver assistance systems
  - Adaptive Cruise Control (ACC)
  - Automatic parking control
  - Collision avoidance system
  - Car black box system
- Infotainment and cluster electronics
  - Audio subsystem: head unit and trunk amp
  - Digital instrument cluster
  - In-Vehicle Infotainment (IVI) and navigation
- Chassis and safety electronics
  - Airbag control unit
  - Electronic Stability Control System (ESC)
  - Electric parking brake
  - Electronic Power Steering (EPS)
  - Anti-Lock Braking System (ABS)

Environmental data

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

The Coiltronics brand of magnetics (formerly of the Bussmann Division of Cooper Industries) is now part of Eaton's Electrical Group, Electronics Division.

Coiltronics is now part of Eaton
Same great products plus even more.

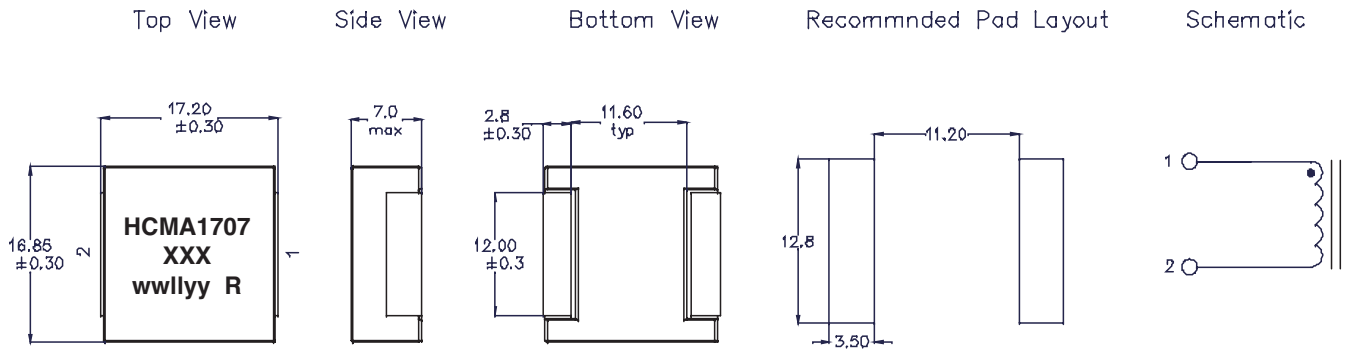
Powering Business Worldwide

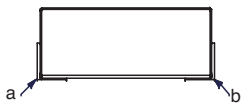
Product specifications

Part Number[6]	OCL[1] ±20% (µH)	FLL min.[2] (µH)	I_{rms}[3] (amps)	I_{sat}[4] (amps)	DCR (mΩ) @ 20°C (typical)	DCR (mΩ) @ 20°C (maximum)	K-factor[5]
HCMA1707-1R5-R	1.5	0.96	40	40	1.85	2.15	124
HCMA1707-2R2-R	2.2	1.41	37	34	2.15	2.50	103
HCMA1707-4R7-R	4.7	3.01	27	24	4.12	4.72	76
HCMA1707-6R8-R	6.8	4.35	20	22	6.55	7.55	60
HCMA1707-8R2-R	8.2	5.25	16	20	8.10	8.70	55
HCMA1707-100-R	10	6.40	14	18	9.30	10	47
HCMA1707-150-R	15	9.60	12	13	14.5	15.5	43
HCMA1707-220-R	22	14.1	9.5	11	21	23	37
HCMA1707-330-R	33	21.1	9.0	10	35	37	28
HCMA1707-470-R	47	30.1	6.8	7.5	41	47	25
HCMA1707-680-R	68	43.5	5.2	6.5	74	85	20

1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.25V_{rms}, 0.0Adc, +25°C.
2. Full Load Inductance (FLL): Test parameters: 100kHz, 0.25V_{rms}, I_{sat}, +25°C.
3. I_{rms}: DC current for an approximate temperature rise of 40°C without core loss. Derating is necessary for AC currents. PCB layout, trace thickness and width, air-flow, and proximity of other heat generating components will affect the temperature rise. It is recommended that the temperature of the part not exceed +125°C under worst case operating conditions verified in the end application.
4. I_{sat}: Peak current for approximately 20% rolloff at +25°C.
5. K-factor: Used to determine B_{p-p} for core loss (see graph). B_{p-p} = K * L * ΔI. B_{p-p}:(Gauss), K: (K-factor from table), L: (Inductance in µH), ΔI (Peak to peak ripple current in amps).
6. Part Number Definition: HCMA1707-yyy-R
   - HCMA1707 = Product code and size
   - yyy= Inductance value in uH, R = decimal point, if no R is present then third character = number of zeros.
   - "-R" suffix = RoHS compliant

Dimensions - mm

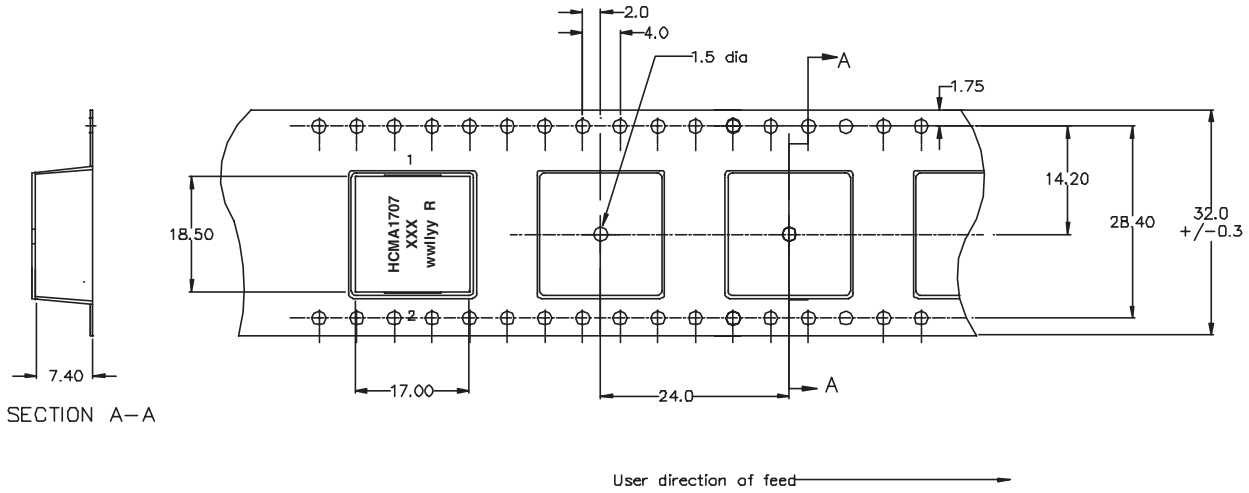




DCR measured between point "a" and point "b"

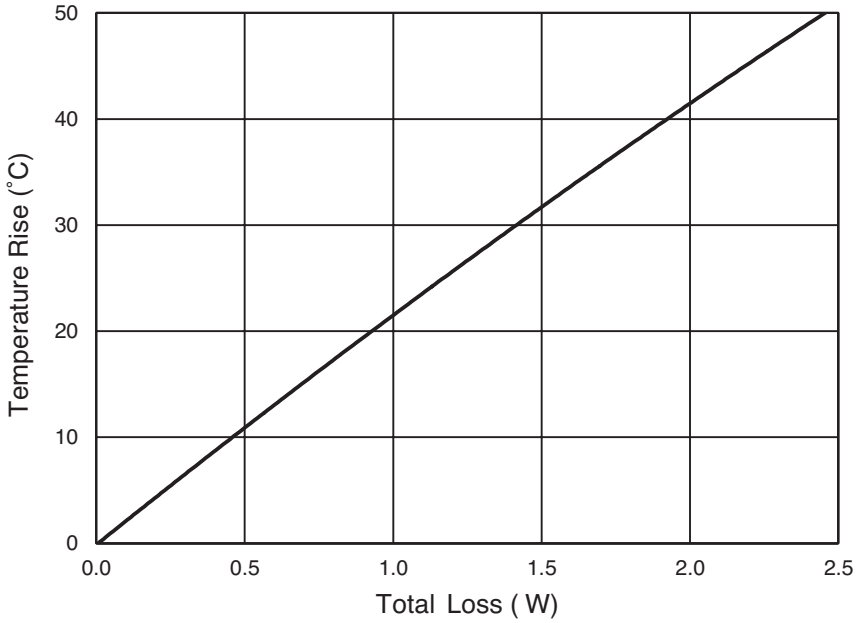
All soldering surfaces coplanar within 0.10 millimeters.
Part marking: HCMA1707; A = Automotive grade, XXX = initial inductance in µH, R = decimal point; if no R is present, last digit equals number of zeros.
wwllyy = date code, R = revision level
Color: Grey.

Packaging information - mm

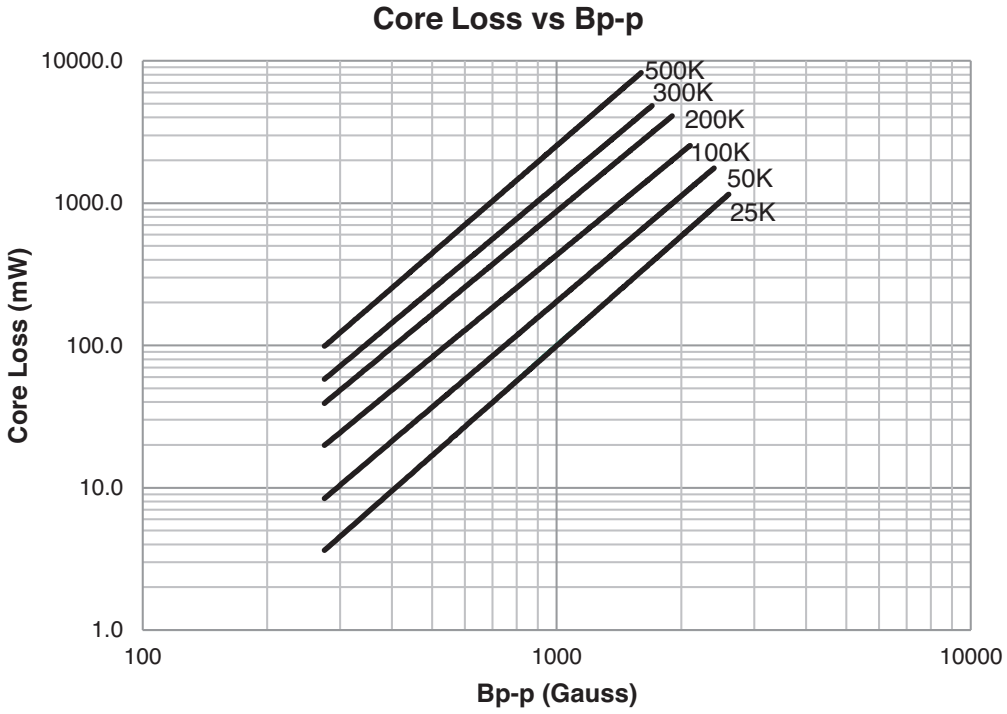


Supplied in tape and reel packaging, 350 parts per 13” diameter reel.

Temperature rise vs. total loss

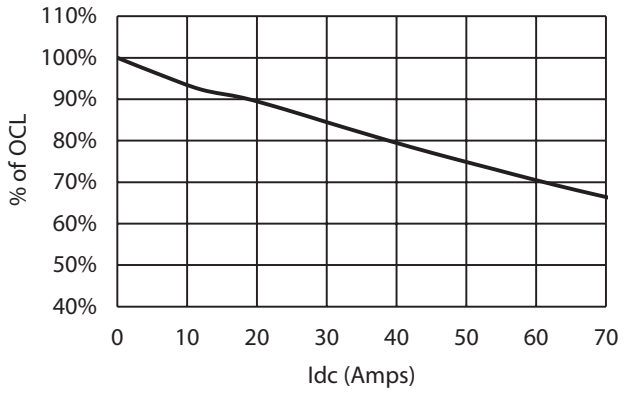


Core loss

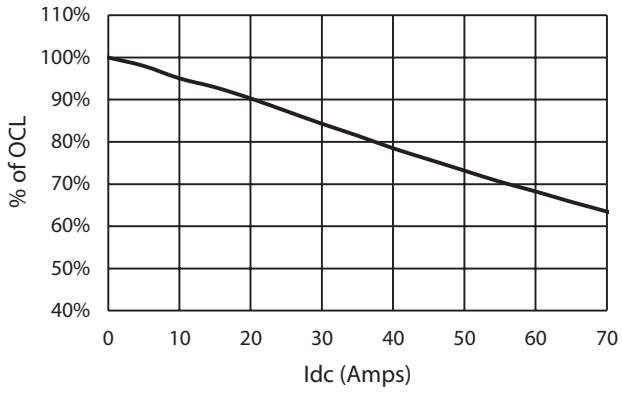


Inductance characteristics

HCMA1707 -1R5-R

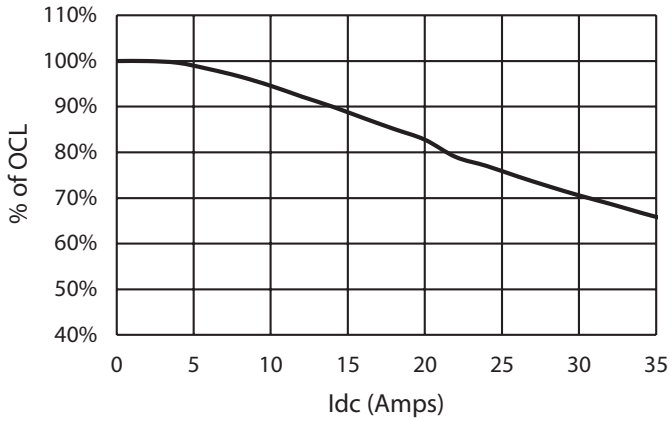


HCMA1707 -2R2-R

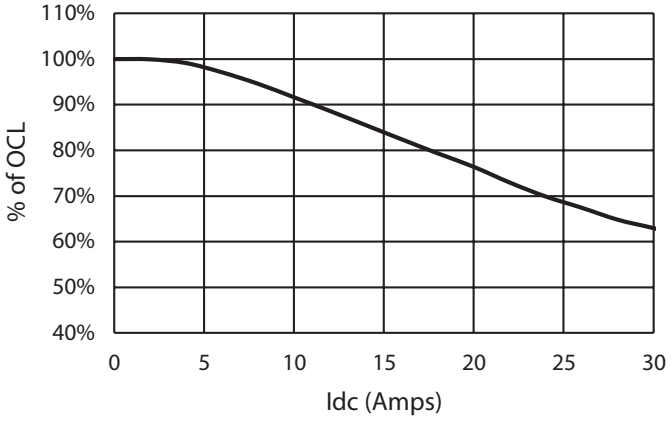


Inductance characteristics

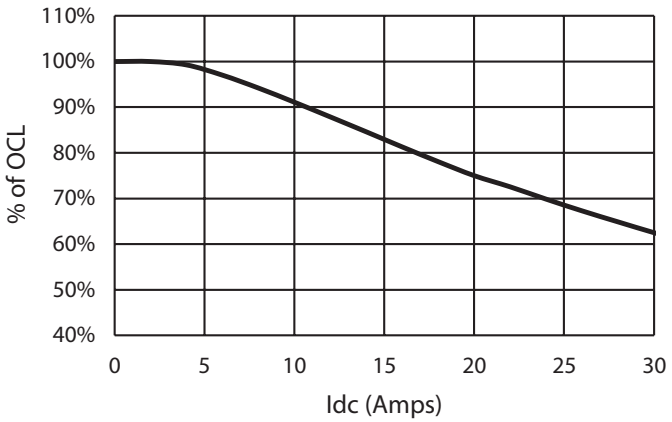
HCMA1707 -4R7-R



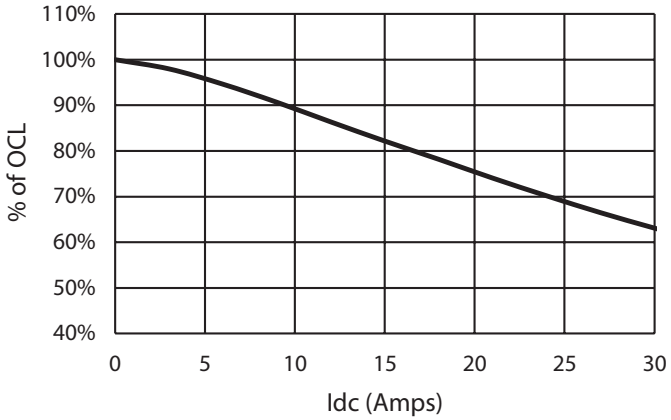
HCMA1707 -6R8-R



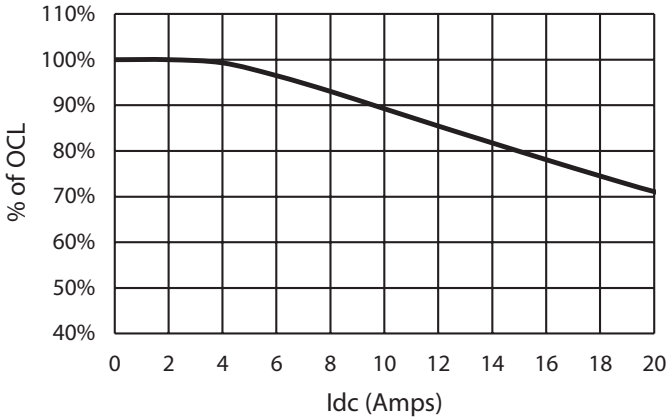
HCMA1707 -8R2-R



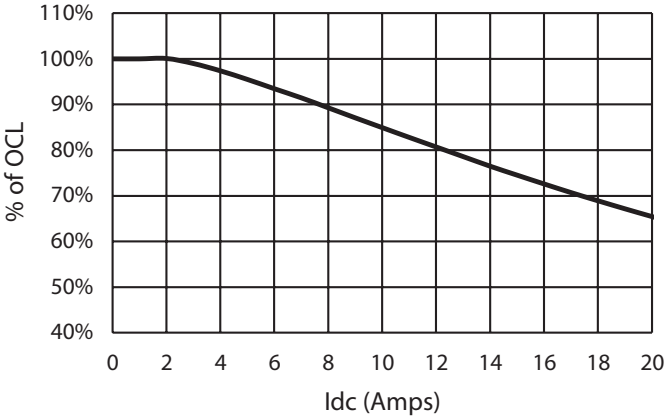
HCMA1707 -100-R



HCMA1707 -150-R

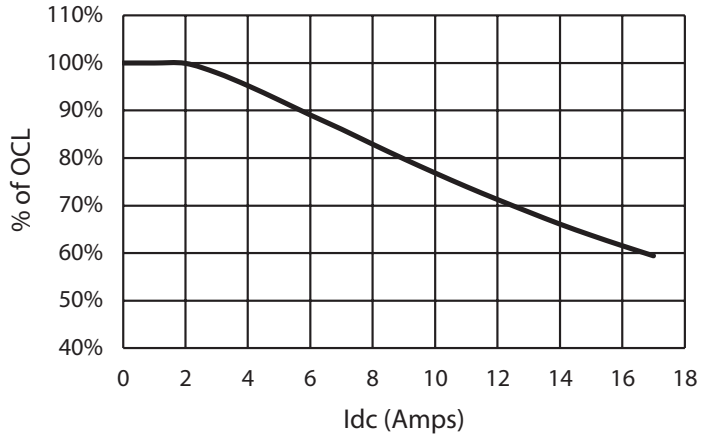


HCMA1707 -220-R

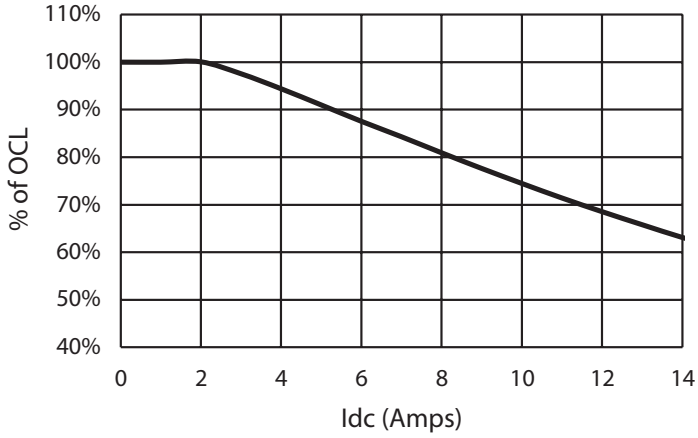


Inductance characteristics

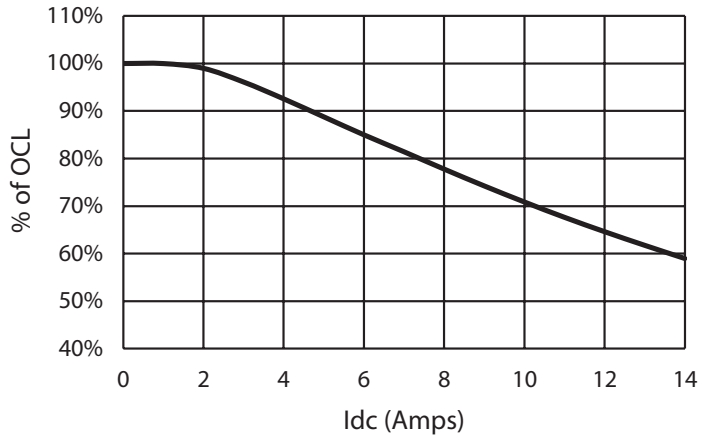
HCMA1707-330-R



HCMA1707-470-R



HCMA1707-680-R



Solder reflow profile

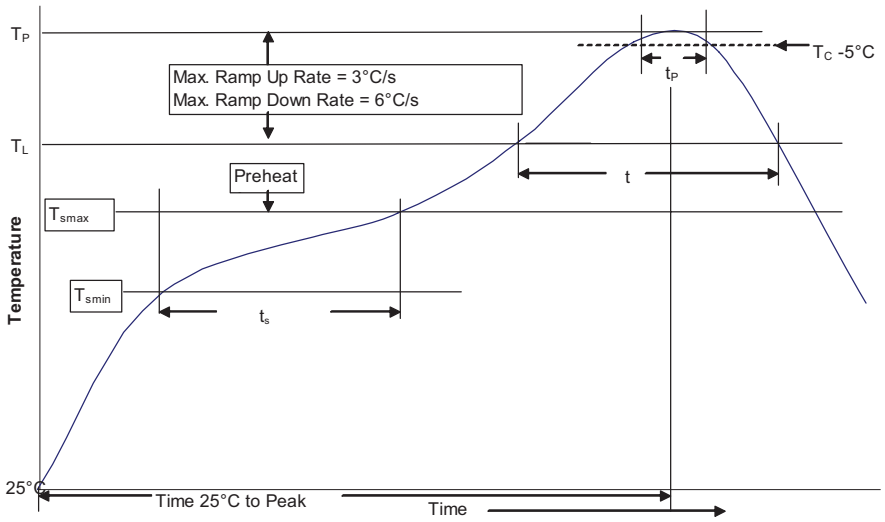


Table 1 - Standard SnPb Solder (T_C)

Package Thickness	Volume mm³ <350	Volume mm³ ≥350
<2.5mm	235°C	220°C
≥2.5mm	220°C	220°C

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

Package Thickness	Volume mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >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-020D

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) Time at liquidous (t_L)		183°C 60-150 Seconds	217°C 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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