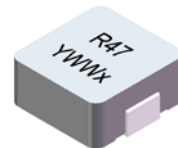


SM2011A Series



1. Features of SM2011A series:

- 5.70 x 5.40mm foot Print , 3.00mm Max. height SMD Power Inductor for high frequency application. Operating frequency up to 5MHz.
- Inductance range from 0.10uH to 10.00uH. Custom values are welcomed.
- High saturation current characteristics by distributed gapped metal dust core.
- Ideal for portable device, Pad, E-reader and high density DC to DC Converter
- Tape & Reel Quantity: 2000 piece per 13 inches reel. RoHS and HF compliant.

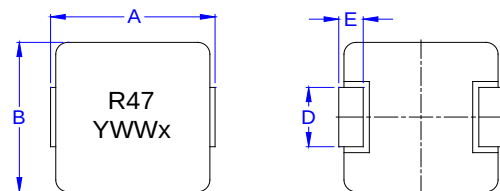


2. Electrical Characteristics of SM2011A series:

ITG Part Number	OCL (uH) ±20%	DCR (mΩ) Typ.	DCR (mΩ) Max.	Isat1 ¹ (A)	Isat2 ² (A)	Irms ³ (A)
SM2011A-R10MHF	0.10	2.40	3.00	25.00	33.00	25.00
SM2011A-R20MHF	0.20	3.30	3.90	21.00	26.00	14.00
SM2011A-R33MHF	0.33	6.50	7.80	16.00	22.00	12.00
SM2011A-R47MHF	0.47	7.85	9.00	12.00	17.50	11.00
SM2011A-R68MHF	0.68	9.80	11.50	9.00	13.50	9.00
SM2011A-R82MHF	0.82	11.00	12.70	8.50	12.00	9.00
SM2011A-1R0MHF	1.00	11.20	12.90	8.00	11.00	8.80
SM2011A-1R2MHF	1.20	12.15	14.00	7.70	11.00	8.50
SM2011A-1R5MHF	1.50	13.75	15.80	7.50	10.50	8.20
SM2011A-2R2MHF	2.20	24.50	28.00	5.20	7.50	7.00
SM2011A-3R3MHF	3.30	33.50	38.50	4.50	6.50	5.50
SM2011A-4R7MHF	4.70	52.20	57.50	3.70	5.50	4.50
SM2011A-6R8MHF	6.80	70.50	81.00	3.50	4.00	3.50
SM2011A-100MHF	10.00	108.60	119.50	2.70	3.90	3.20

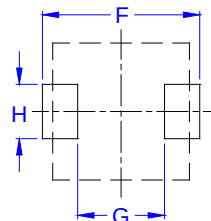
3. Mechanical Dimensions (unit: mm):

A ± 0.30	B ± 0.20	C ± 0.20	D ± 0.30	E ± 0.20
5.40	5.20	2.80	2.20	1.20



Part Marking:
R47: Inductance value in uH(R:decimal point)
YWWx: Y is Year Code, WW: week ,
x is Special Code

Pad Dimension	SM2011A
F	6.00 Typ.
G	2.20 Typ.
H	2.50 Typ.

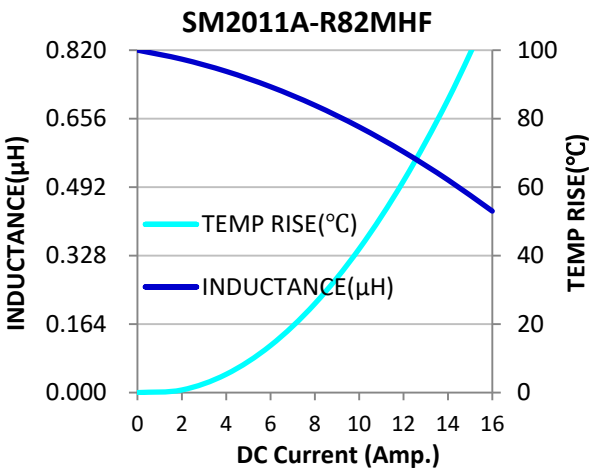
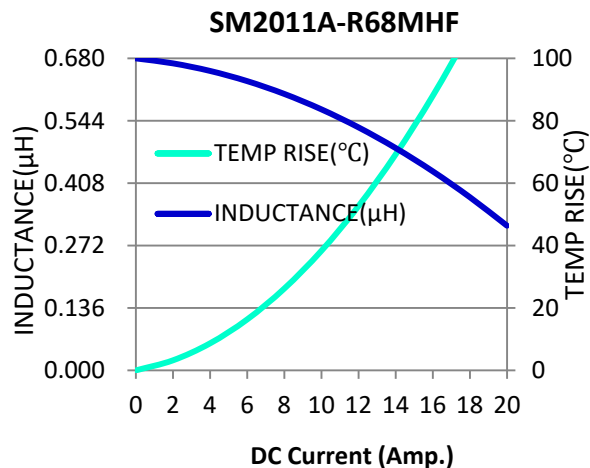
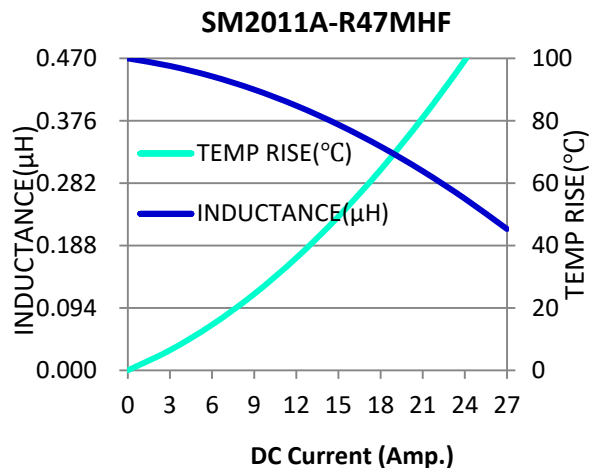
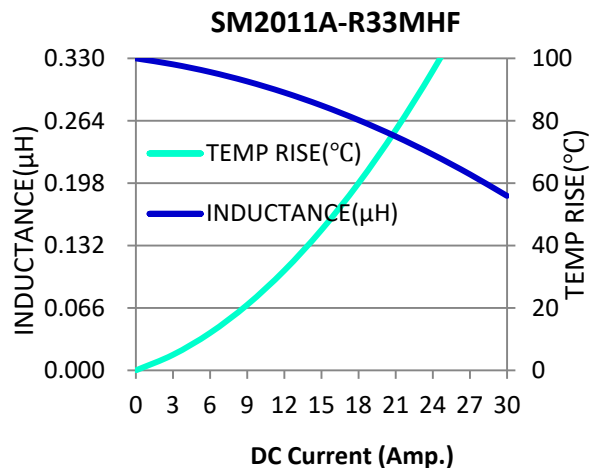
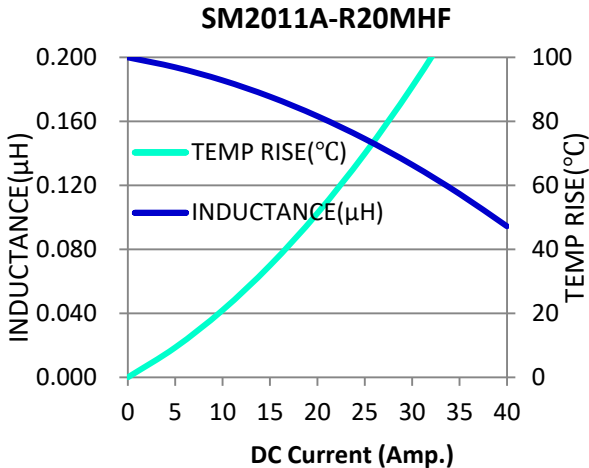
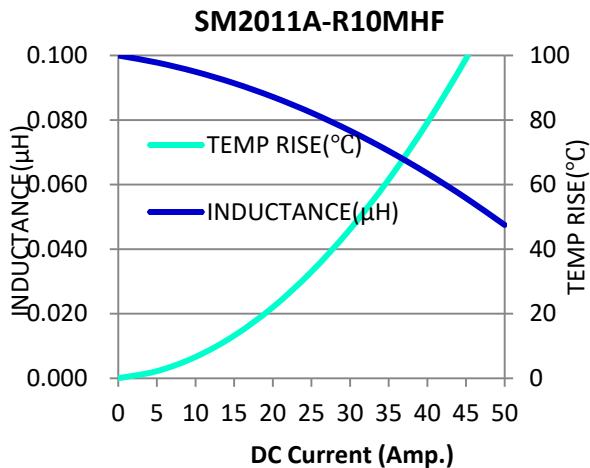


Recommend PCB Layout

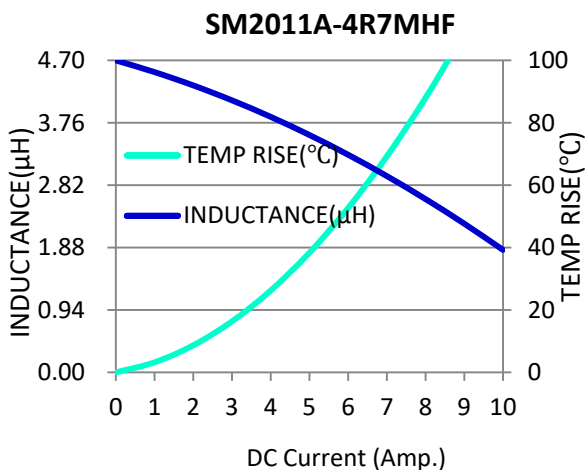
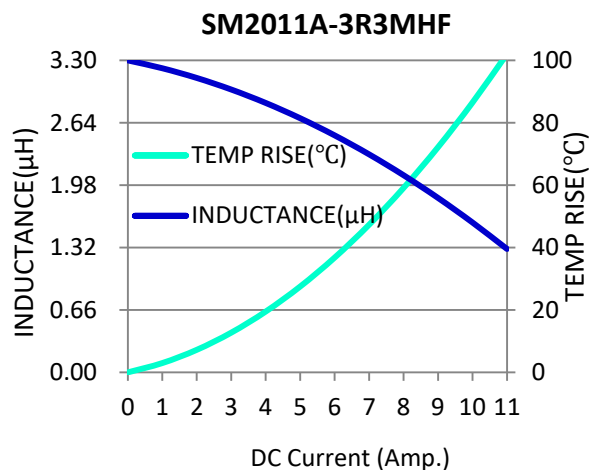
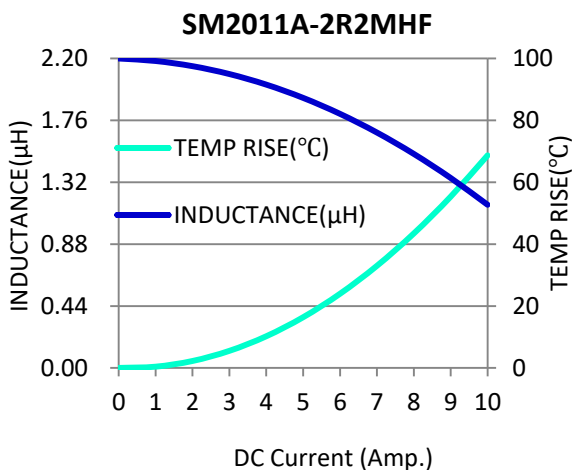
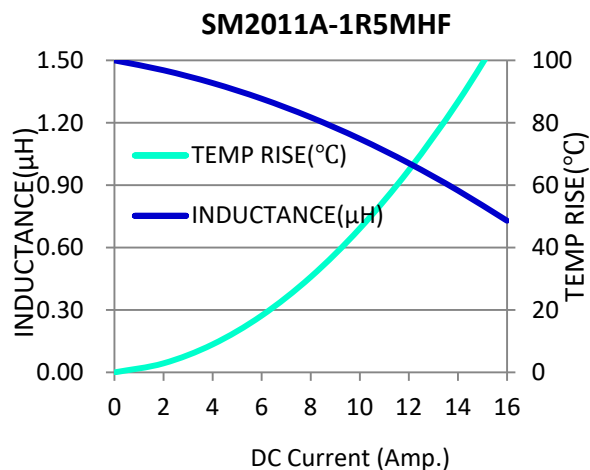
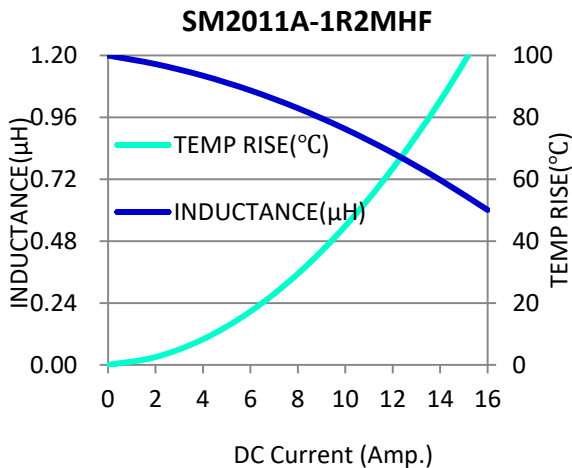
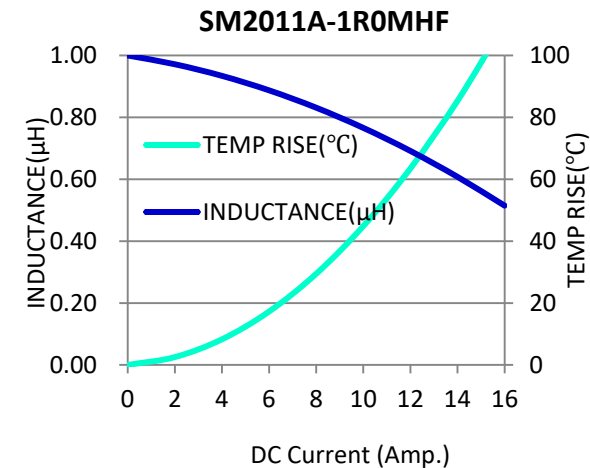
Notes:

1. Isat1: DC current that causes inductance to drop 20%(Typ.) from OCL (Ta=25°C).
2. Isat2: DC current that causes inductance to drop 30%(Typ.) from OCL (Ta=25°C).
3. Irms: DC current that will cause an approximate ΔT of 40°C . Derating is necessary for AC currents. PCB pad layout, trace thickness and width, air-flow and proximity of other heat generating components will affect the temperature rise. It is recommended the part temperature not exceed 125° C under worst case operating conditions as verified in the end application
4. Test conditions: 100KHz, 1.0V, 25°C ambient temperature .
5. Operating Temperature Range: -55°C to 125°C .

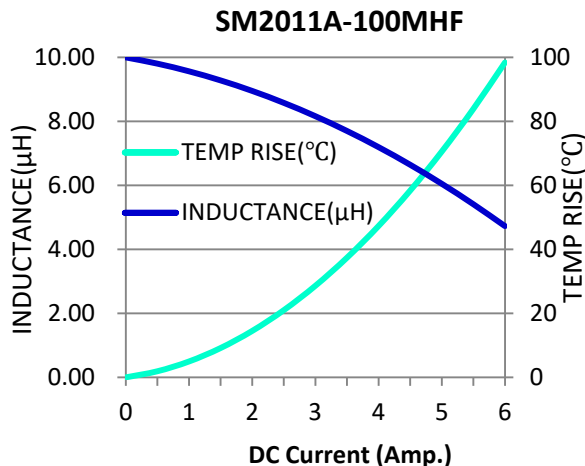
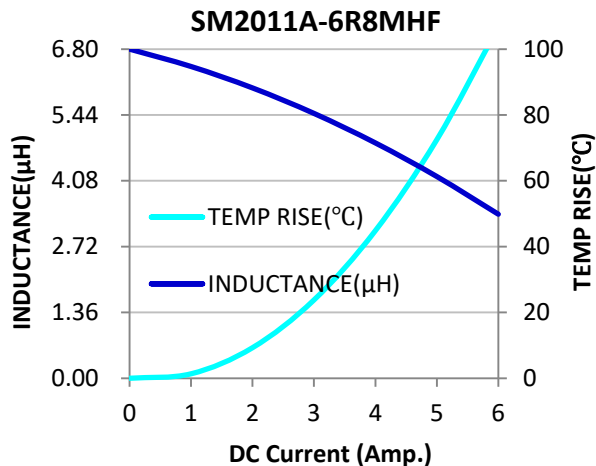
4. Inductance vs. Current vs. Temperature Rise Characteristics SM2011A Series :



4. Inductance vs. Current vs. Temperature Rise Characteristics SM2011A Series :

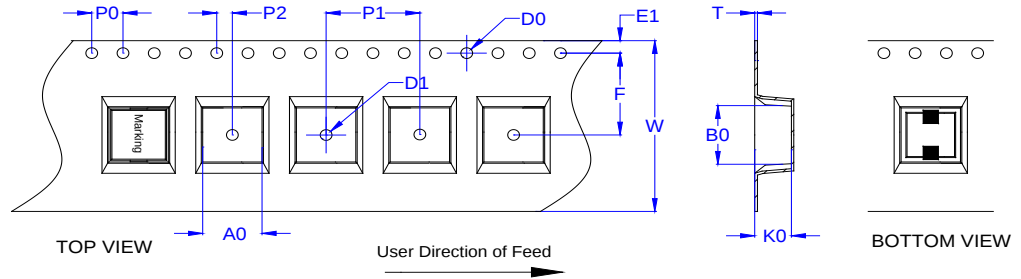


4. Inductance vs. Current vs. Temperature Rise Characteristics SM2011A Series :



5. PACKAGE SPECIFICATION.(UNIT:mm):

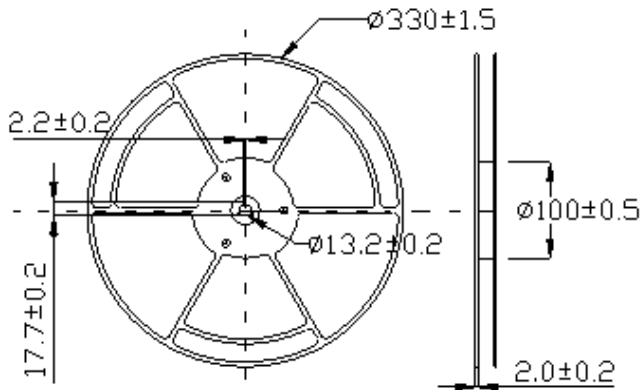
(1).ENCAPSULATION MODE:



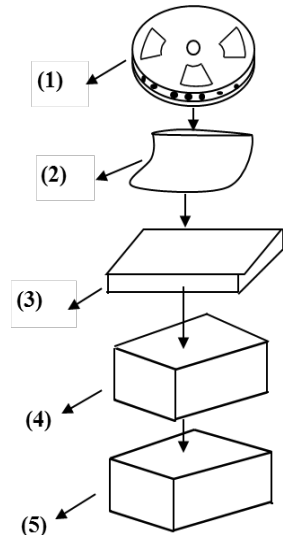
(2).DIMENSION(mm):

W	A0	B0	K0	P1	P0	P2	D0	D1	F	E1	T
12.0±0.30	5.4±0.10	5.9±0.10	3.3±0.15	8.0±0.10	4.0±0.10	2.0±0.10	1.5±0.10	1.5±0.10	5.5±0.10	1.75±0.10	0.35±0.05

(3).REEL SIZE:



(4).PACKAGE MODE:



(5).PACKAGING LIST:

No.	Packing Part	Dimension (mm)	Material	Quantity
1	Reel	330	Plastic	2000PCS / Reel
2	Bag	450 X 360 X 0.075	Plastic	1Reel / Bag
3	Small Box	340 X 335 X 45	Paper	2Bag / Small Box
4	Middle Box	356 X 350 X 226	Paper	4Small Boxes / Middle Box
5	Outer Box	378 X 362 X 252	Paper	1Middle Box / Outer Box

(6).WEIGHT: N.W: 0.43 g/pcs (APPROX), TOTAL 6.88 Kg(APPROX),G.W:TOTAL 12.08Kg (APPROX).

(7).Storage conditions: -40°C~85°C ,75%RH (Max.).

6.RELIABILITY TEST:

6.1 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: 255 ± 5 °C for 5 ± 0.5 seconds
Vibration	Inductance change: Within $\pm 10\%$ Without mechanical damage such as break	1. Vibration frequency:(10 Hz to 2000 Hz) 2. Vibration time:Each four hours (12 times) in X, Y, Z direction: 12 hours in total 3. Amplitude: 1mm or 10 G
Shock	Inductance change: Within $\pm 10\%$ Without mechanical damage such as break	1. Peak value: 100 G 2. Duration of pulse: 6ms 3. Waveform: Half-sine Shocks; 3 times in X, Y, Z direction, 9 times in total
6.2 Endurance Reliability		
Thermal Shock	Inductance change: Within $\pm 10\%$ Without distinct damage in appearance	1. Repeat 1000 cycles as follow: (-55 ± 2 °C; 30 ± 3 min) → ($+125 \pm 2$ °C, 30 ± 3 min) change over time of temperature: ≤ 10 s 2. Recovery: $24 + 4 / -0$ hours of recovery under the standard condition after the test.
High Temperature & Humidity	Inductance change: Within $\pm 10\%$ Without distinct damage in appearance	$85^{\circ}\text{C}85\%\text{RH}$, Duration: $240+4/-0$ hours.
Operational Life	Inductance change: Within $\pm 10\%$ Without distinct damage in appearance	1.Rated current (Idc) Environment condition: 85 °C 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

Soldering Reflow Chart

Solder Reflow Profile:

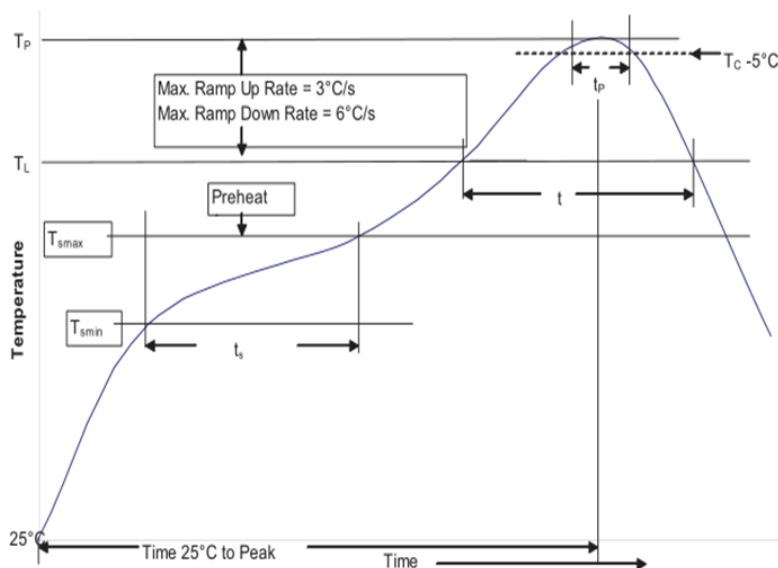


Table 1 - Standard SnPb Solder (T_c)

Package Thickness	Volume mm^3 <350	Volume mm^3 ≥ 350
<2.5mm	235°C	220°C
$\geq 2.5\text{mm}$	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 JEDEC J-STD-020E:

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.