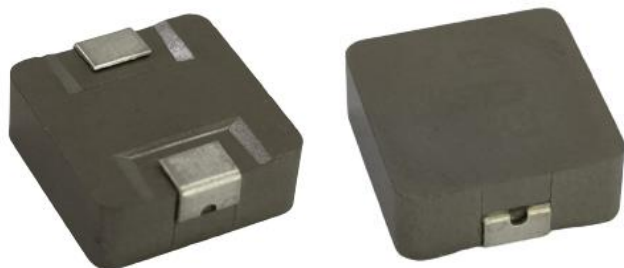


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High Current, Power Inductors

LPCA-1040-XXX-M Power Choke



Description

- Halogen Free
- 125°C maximum total temperature operation
- 11.5x10.3x4.0mm maximum surface mount package
- Magnetically shielded, low EMI
- High current carrying capacity, Low core losses
- RoHS compliant

Applications

- Voltage Regulator Module (VRM)
- 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-020 compliant

Description												
LPCA-1040-220-M				22.0μH				±20 %				
Model				Inductance Value				Inductance Tolerance				
Global Part Number												
L	P	C	A	1	0	4	0	2	2	0	M	
Product Series				Dimensions				Inductance Value			Tolerance	

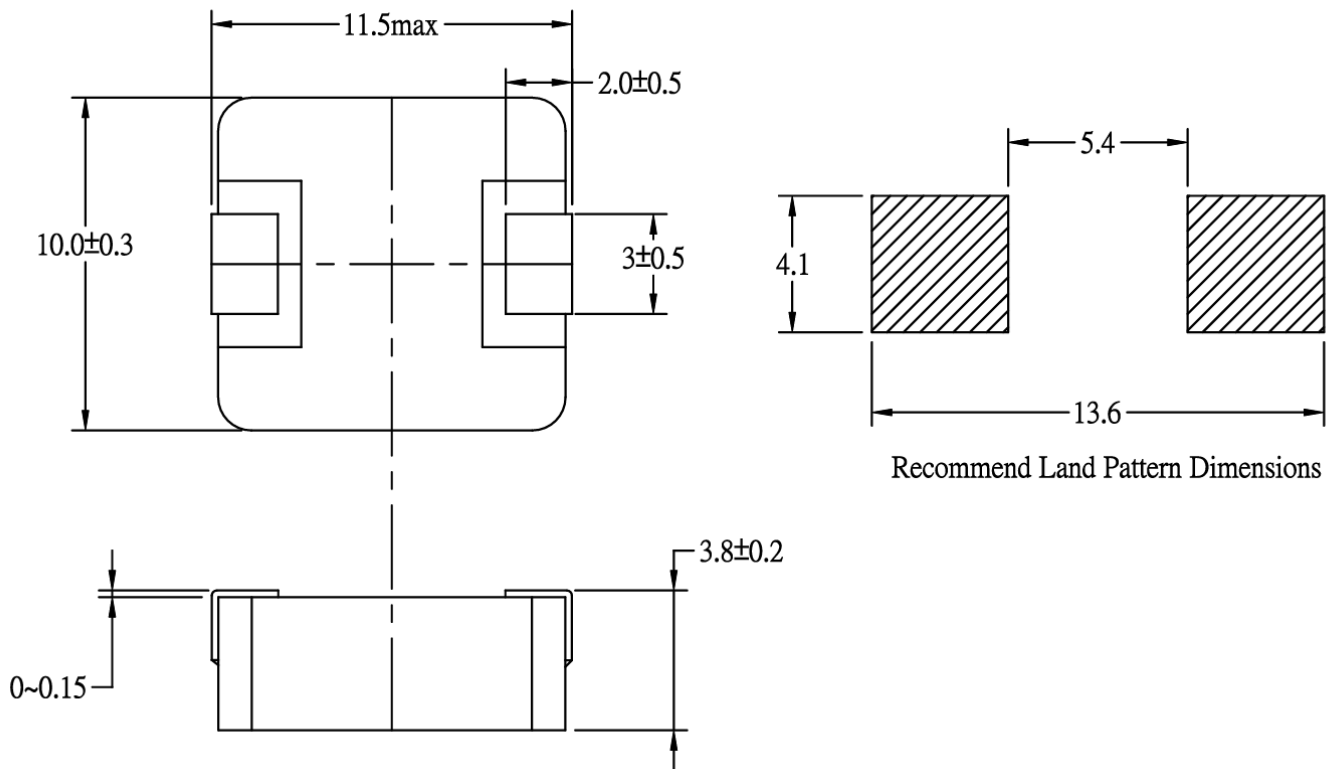


Part No.	Inductance	DC Resistance		Heating Rating Current	Saturation Current
	L0 (μH)	DCR (mΩ)		Idc (A)	Isat (A)
	±20 %, 1MHz, 1V	TYP.	MAX.	TYP.	TYP.
LPCA-1040-R15-M	0.15	0.5	0.65	45.0	75.0
LPCA-1040-R22-M	0.22	0.9	1.0	35.0	60.0
LPCA-1040-R30-M	0.30	0.95	1.1	35.0	50.0
LPCA-1040-R36-M	0.36	1.05	1.2	30.0	50.0
LPCA-1040-R47-M	0.47	1.5	1.7	30.0	40.0
LPCA-1040-R56-M	0.56	1.6	1.8	25.0	33.0
LPCA-1040-R68-M	0.68	2.1	2.4	23.0	30.0
LPCA-1040-R80-M	0.80	2.6	2.7	23.0	29.0
LPCA-1040-1R0-M	1.0	3.0	3.3	19.0	28.0
LPCA-1040-1R5-M	1.5	3.8	4.2	16.0	26.0
LPCA-1040-2R2-M	2.2	6.0	7.0	12.0	18.0
LPCA-1040-3R3-M	3.3	10.0	11.8	11.0	16.0
LPCA-1040-4R7-M	4.7	17.0	20.0	9.0	15.0
LPCA-1040-5R6-M	5.6	19.0	23.0	8.5	13.5
LPCA-1040-6R8-M	6.8	22.0	25.0	8.5	12.0
LPCA-1040-8R2-M	8.2	25.0	27.0	8.0	9.0
LPCA-1040-100-M	10.0	27.0	30.0	7.8	8.5
LPCA-1040-150-M	15.0	40.0	45.0	6.5	7.0
LPCA-1040-220-M	22.0	58.0	66.0	5.0	5.5
LPCA-1040-330-M	33.0	85.0	92.0	4.4	5.0
LPCA-1040-470-M	47.0	130.0	145.0	3.3	3.5
LPCA-1040-560-M	56.0	170.0	190.0	3.0	3.3
LPCA-1040-680-M	68.0	178.0	195.0	2.5	3.0
LPCA-1040-101-M	100	315.0	350.0	2.2	2.3

Notes

1. All test data is referenced to 25 °C ambient
2. Operating temperature range - 55 °C to + 125 °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 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.

•Dimensions-mm

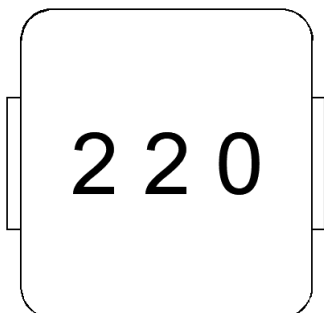


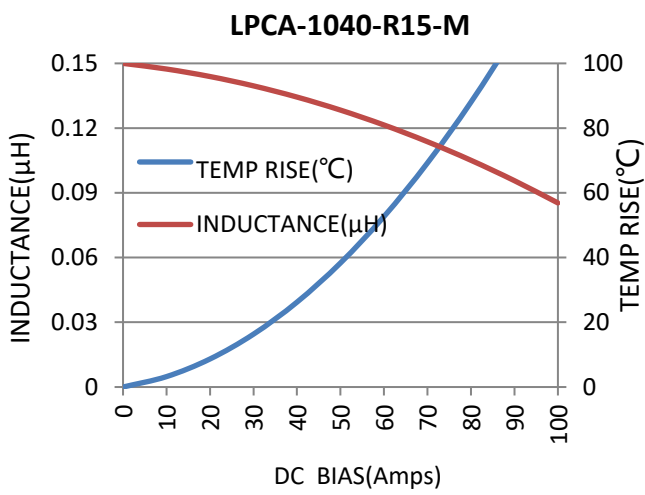
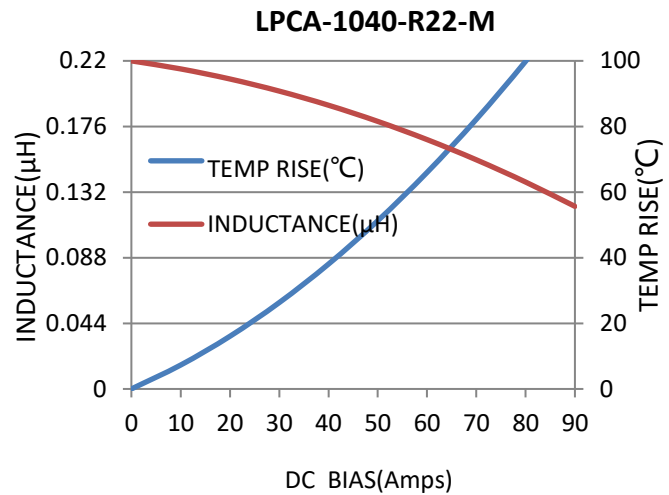
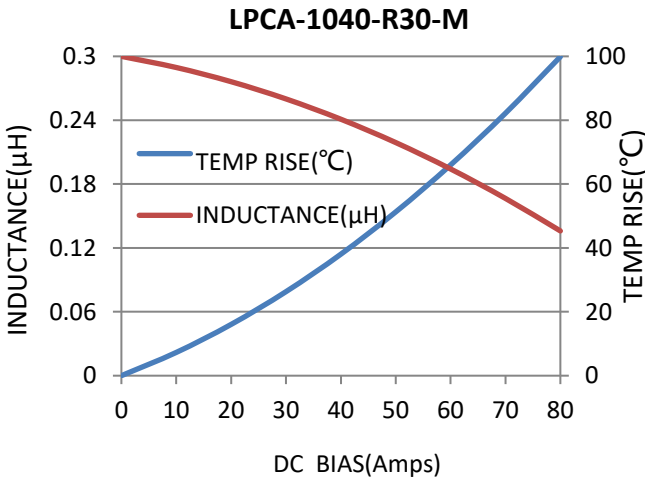
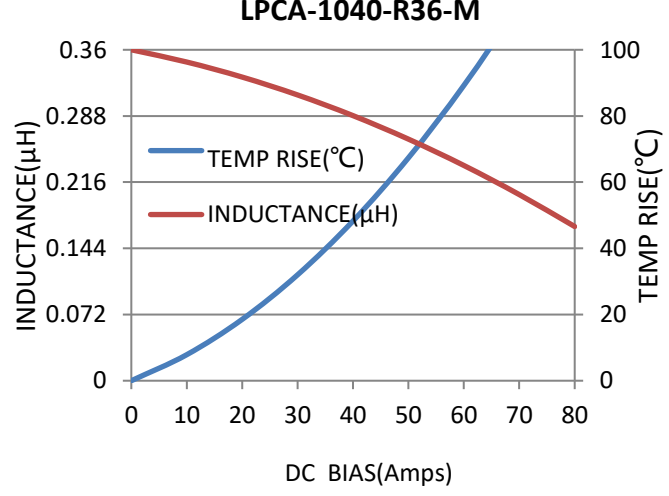
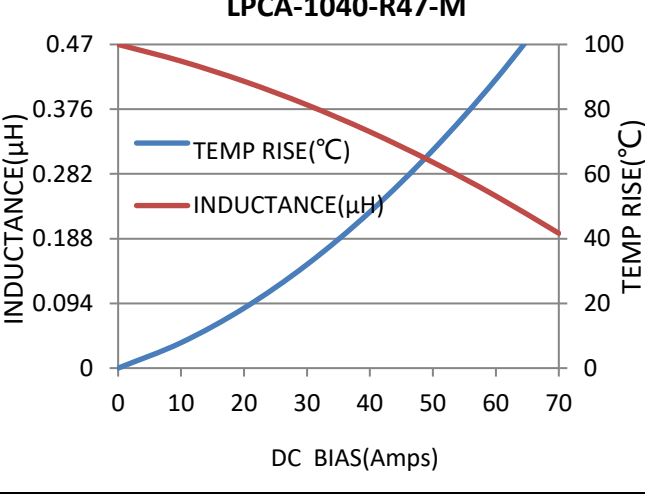
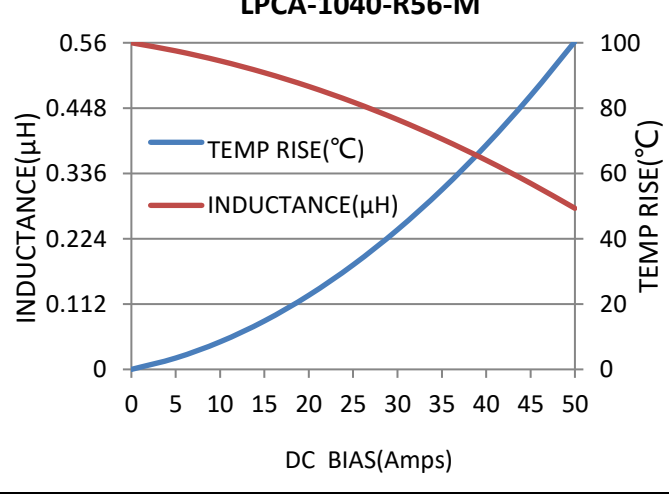
• Marking

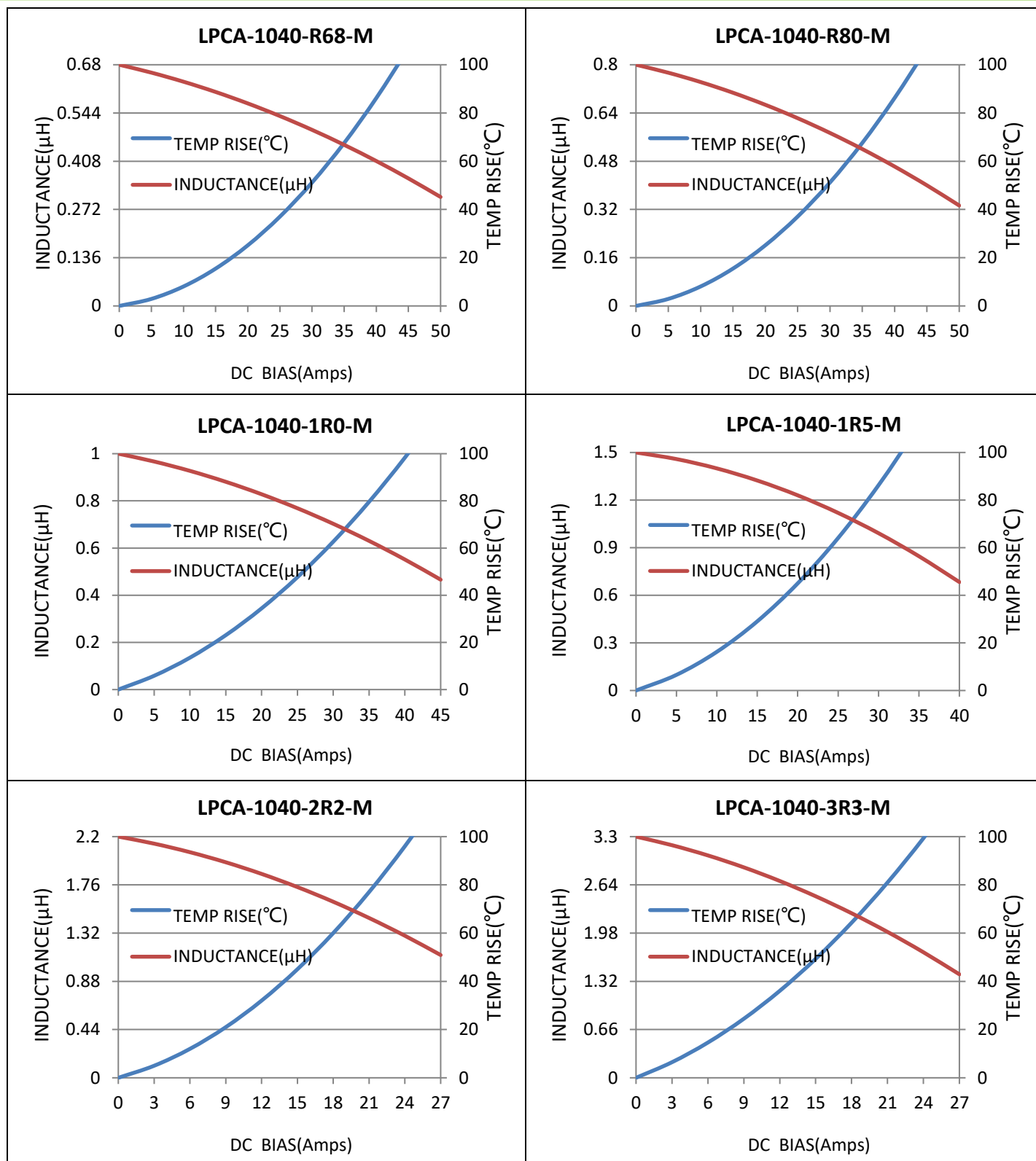
The inductor is marked with a 3-digit code

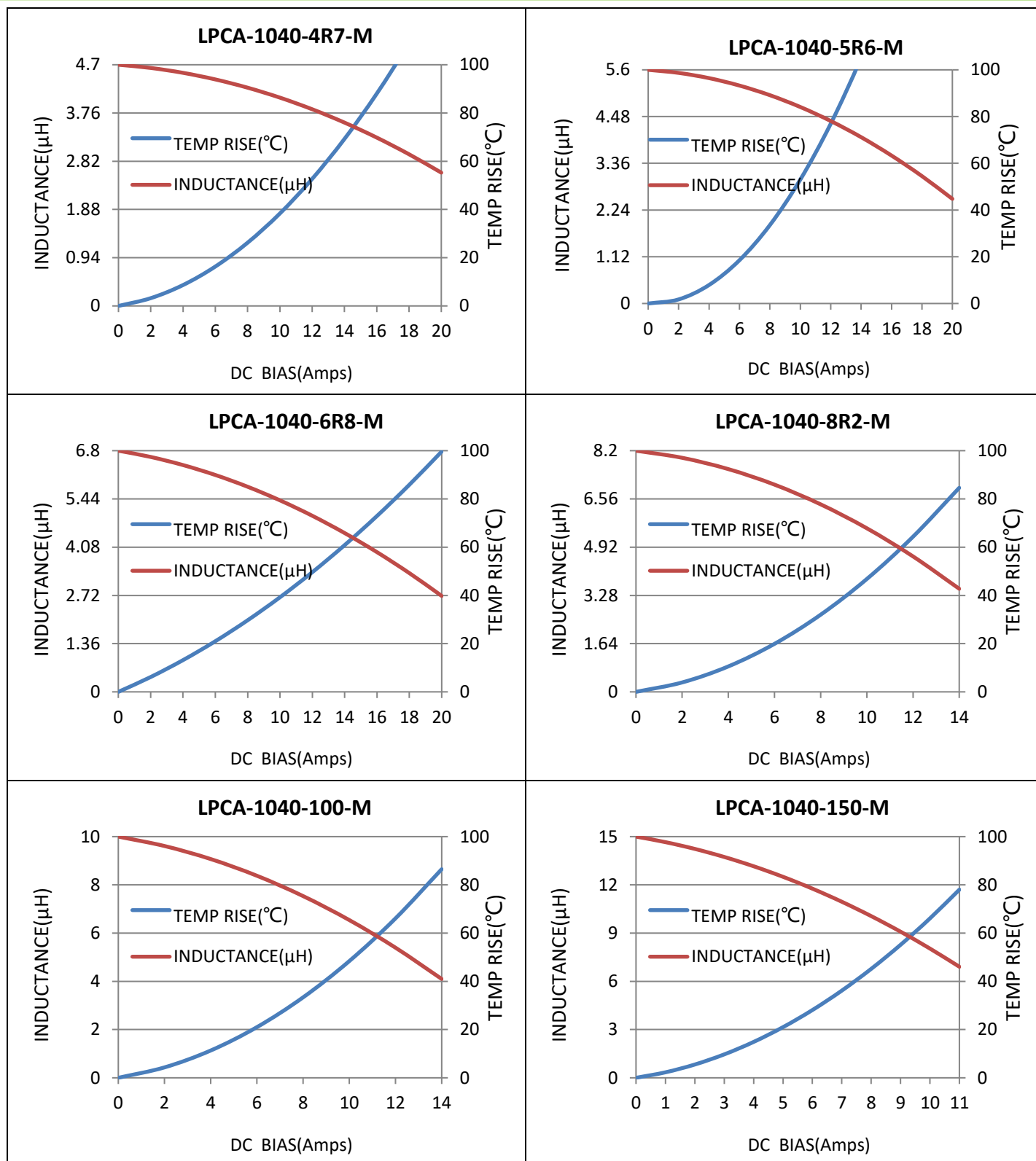
Example - -22.0→220

Note : Using Ink for marking

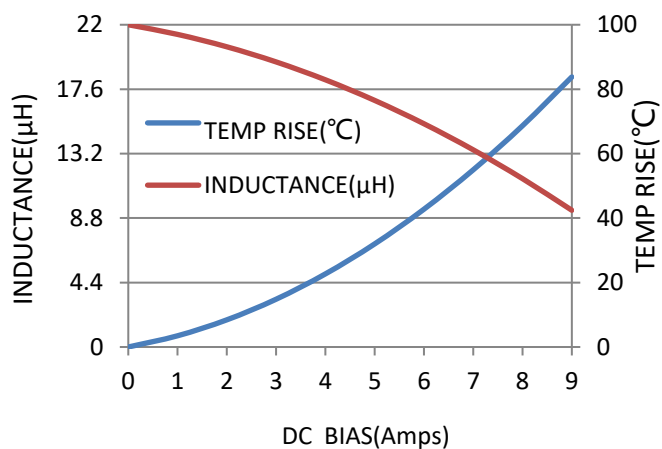


Test Instruments	Test Condition
Wayne kerr 3260B/G LCR Meter Wayne kerr 3265B Bias Current Source	Temperature: $26 \pm 3^{\circ}\text{C}$ Humidity: < 70% RH Frequency: 1MHz, 1.0V
LPCA-1040-R15-M 	LPCA-1040-R22-M 
LPCA-1040-R30-M 	LPCA-1040-R36-M 
LPCA-1040-R47-M 	LPCA-1040-R56-M 

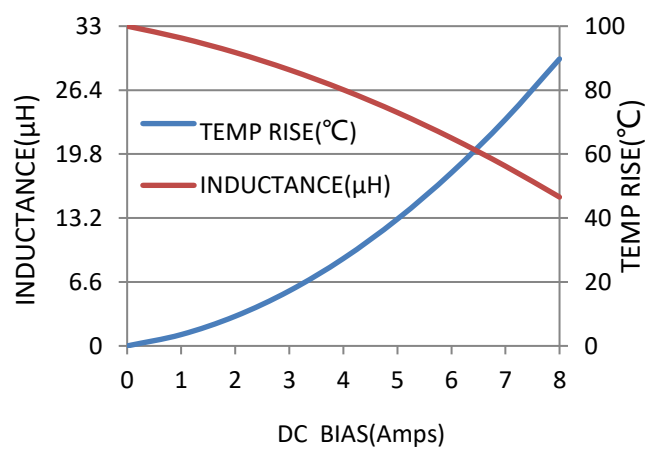




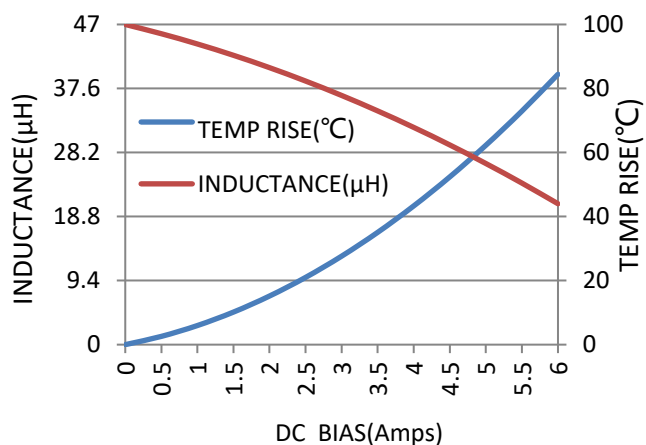
LPCA-1040-220-M



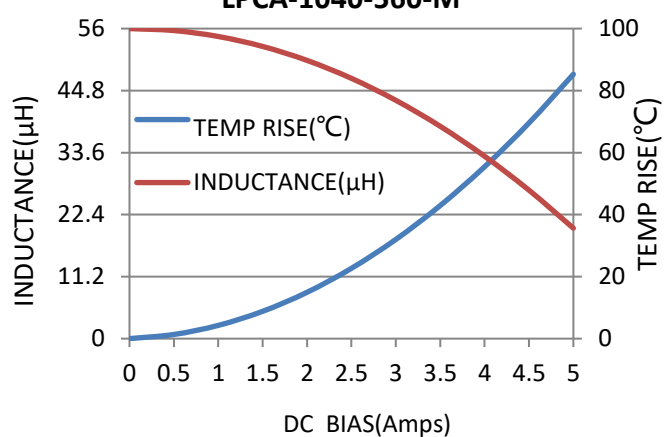
LPCA-1040-330-M



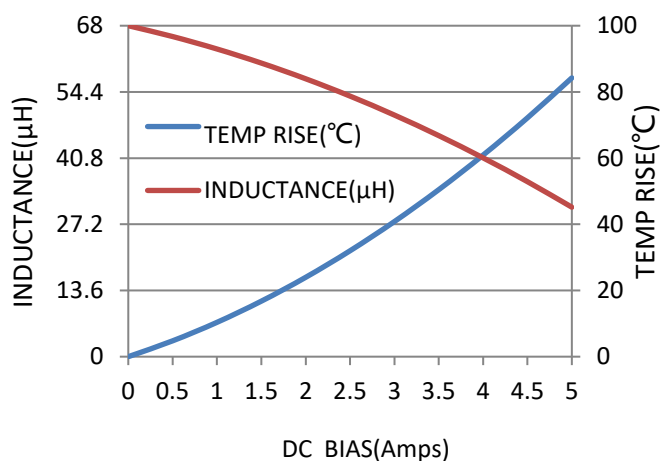
LPCA-1040-470-M



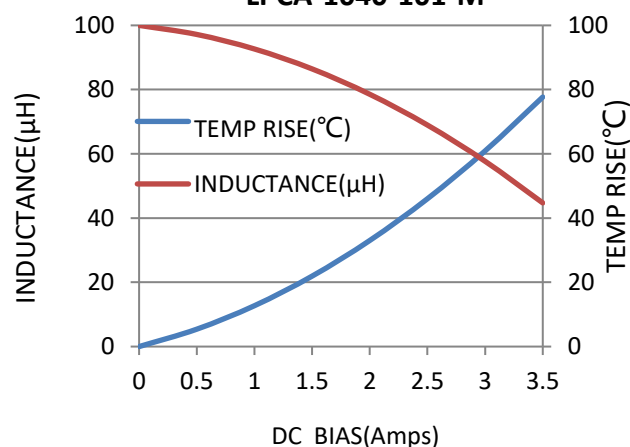
LPCA-1040-560-M



LPCA-1040-680-M



LPCA-1040-101-M



Solder Reflow Profile

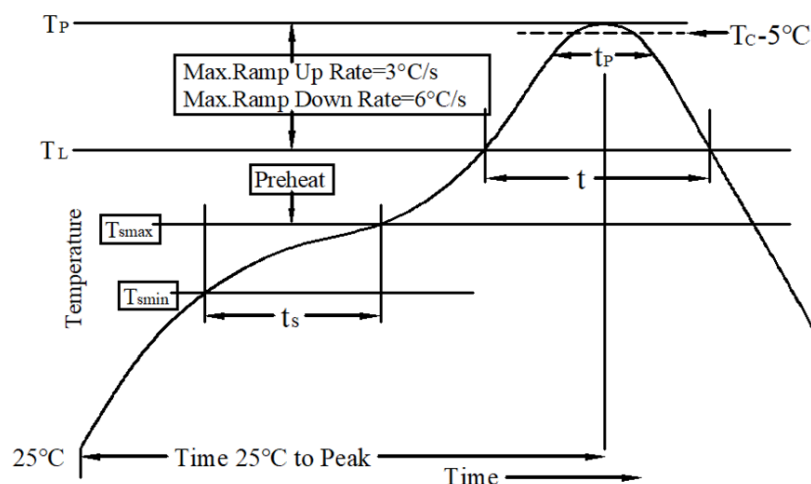


Table 1-Standard SnPb Solder(T_c)

Package Thickness	Volume mm^3	Volume mm^3
	<350	<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	Volume mm^3	Volume mm^3
	<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 e (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 temperaure (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.

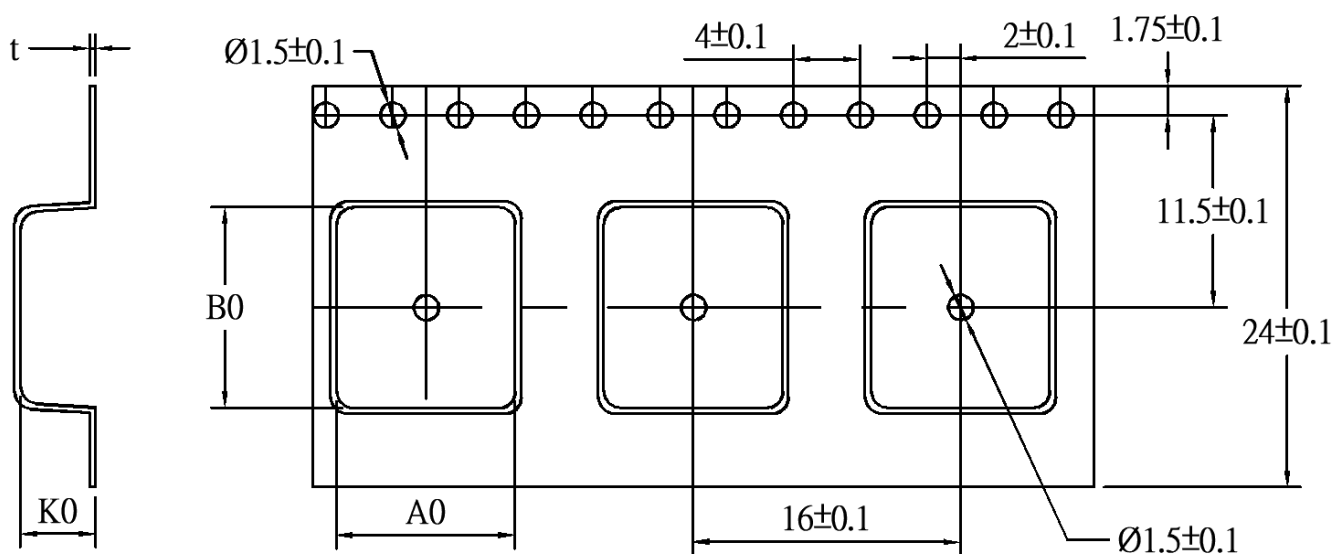
* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

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



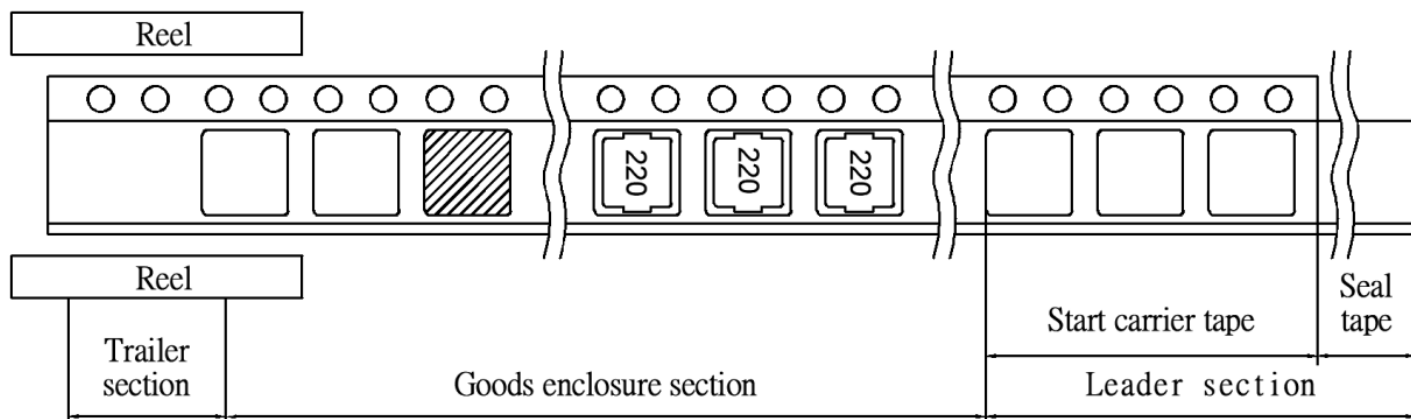
Mechanical Reliability			
No.	Item	Specification and Requirement	Test Method
1	Solderability	The surface of terminal immersed shall be minimum of 95% covered with a new coating of solder	Retention time: 245 ± 5 °C for 5+0/-0.5seconds;
2	Resistance to Soldering Heat	Change from an initial value Inductance:within $\pm 10\%$	Retention time: within 30 seconds 255 ± 5 °C , Three Times;
3	Terminal Strength	No electrode detachment	No electrode detachment should be found when the device is pushed is two directions of X and Y with the force of 17.7N for 60 seconds after soldering between copper plate and the electrodes;
4	Vibration	Inductance change: Within $\pm 10\%$ Without mechanical damage such as break	1. Vibration frequency: (10 Hz to 2000 Hz to 10Hz) in 20 minutes as a period; 2. Vibration time: Period cycled for four hours in each of 3 mutual perpendicular directions. 3. Amplitude: 1.5 mm max.
5	Mechanical Shock	Inductance change: Within $\pm 10\%$ Without mechanical damage such as break	1. Peak value: 100 G, Duration of pulse: 6ms 2. 3 times in each positive and negative direction of 3 mutual perpendicular directions;
6	Substrate Bending	Inductance change: Within $\pm 10\%$ Without distinct damage in appearance	1.Bending speed is 0.5mm/sec, 2.While the bending width reaches 2mm, keep it for 60 sec
Endurance Reliability			
No.	Item	Specification and Requirement	Test Method
7	Thermal Shock	Inductance change: Within $\pm 10\%$ Without distinct damage in appearance	Repeat 1000 cycles as follow: (-55 ± 2 °C; 30 ± 3 min) $\rightarrow$ ($+125 \pm 2$ °C , 30 ± 3 min)
8	Operational Life	Inductance change: Within $\pm 10\%$ Without distinct damage in appearance	Rated current (Idc) Environment condition: 85°C Duration: 1000 + 4 / -0 hours
9	High Temperature Storage	Inductance change: Within $\pm 10\%$ Without distinct damage in appearance	Store temperature: $+125 \pm 2$ °C, 1000 + 4 / -0 hours;
10	High Temperature & Humidity	Inductance change: Within $\pm 10\%$ Without distinct damage in appearance	85°C85%RH ,1000+4/-0 hours;

Tape Packaging Dimensions-mm



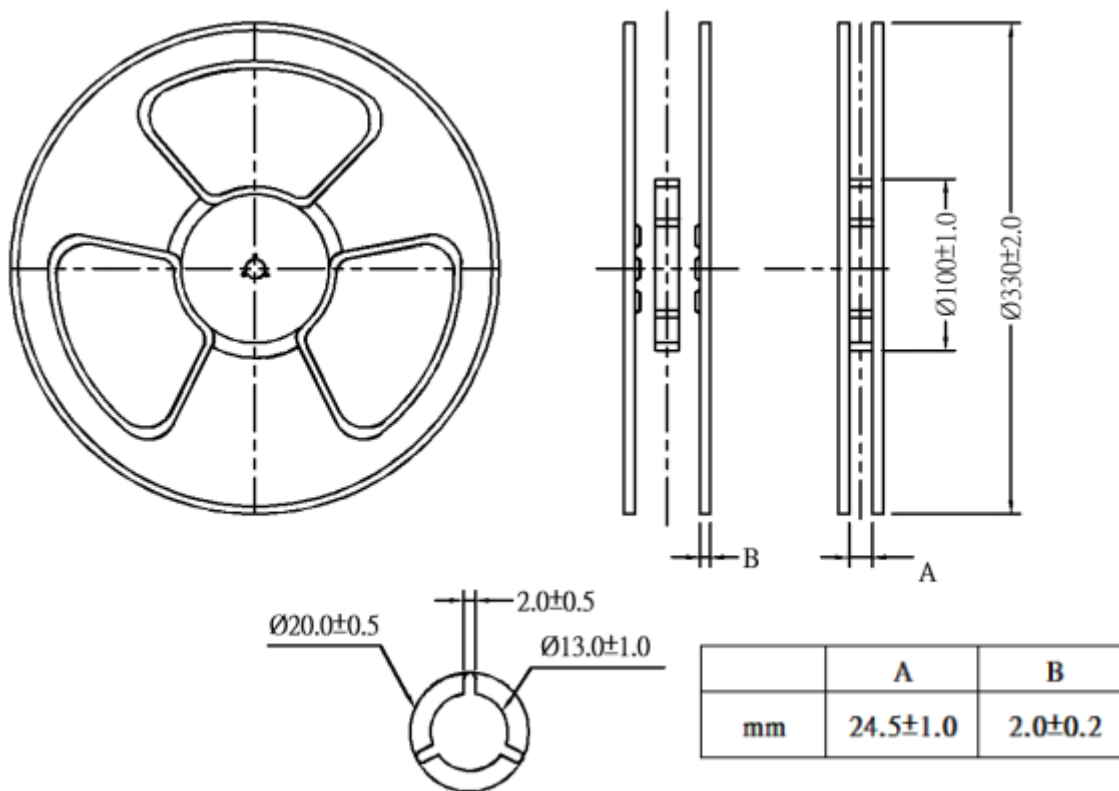
A0	B0	K0	t
10.7±0.10	12.0±0.10	4.5±0.10	0.35±0.025

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



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

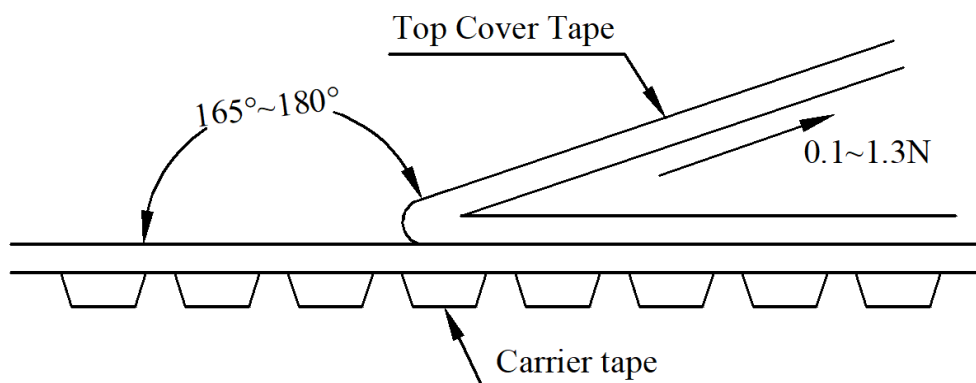
Reel Dimensions-mm



• 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

500pieces/reel