

The history of revision change for the specification

Document	REV.	Modified date	Description
BBQP-2021-I001	A0	2021/10/12	New approval
BBQP-2021-I001	A1	2023/01/11	Add product size (A/B etc.) definition
BBQP-2021-I001	A2	2023/06/06	1. Modify the spec. of 220 2. Year code: 2023/01/11→2023/06/06
BBQP-2021-I001	A3	2024/09/29	1. Revised print coding principles 2. Year code: 2023/06/06→2024/09/29
BBQP-2021-I001	A4	2024/12/16	1. Add 330 spec and curve 2. Year code:2024/09/29→2024/12/16
BBQP-2021-I001	A5	2025/05/23	1. Add R15 spec and curve 2. Year code:2024/12/16→2025/05/23
BBQP-2021-I001	A6	2025/09/15	1. Add R22 spec and curve 2. Year code:2025/05/23→2025/09/15
BBQP-2021-I001	A7	2026/07/07	1. Delete the spec. of 330 2. Year code: 2025/09/15→2026/07/07

● Features

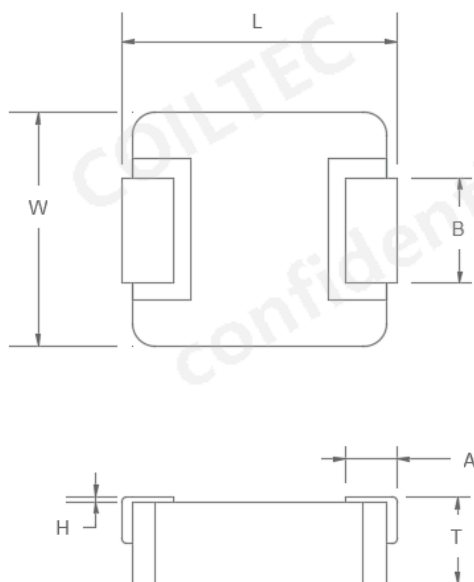
High performance (Isat) realized by metal dust core.
 Low profile: Thickness max. 3.0mm
 Low loss realized with low DCR
 Capable of corresponding high frequency
 Compliance with RoHS and Halogen Free
 AEC-Q200 qualified

AEC-Q200

● Application

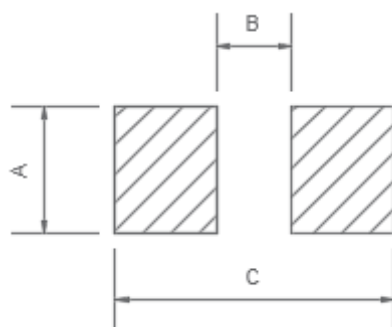
Automotive applications

● Outline Dimensions



Code	Dimensions(mm)
L	5.45±0.35
W	5.25±0.2
B	2.54±0.3
A	1.02±0.3
H	0~0.15
T	3.0Max

Recommend Land Patterns



A	2.79
B	2.95
C	6.76
Unit:mm	

● Type Designation

VCLS	0530	R33	M	T5
Series Name	Dimensions	Inductance value	Tolerance Code	Temperature resistance
V: Automotive C: Power Choke	05 series 3.0 height	0.33μH	J:5% K:10% L:15% M:20% P:25% N:30%	155°C

● Marking

The point on the top surface represents winding direction of choke.

1) Marking

The inductor is marked with a 3-digit code

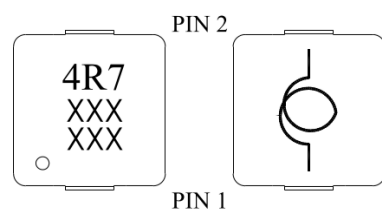
Example - - 4.7μH → 4R7

2) X X X

X X X

Internal code

Upside of Chip



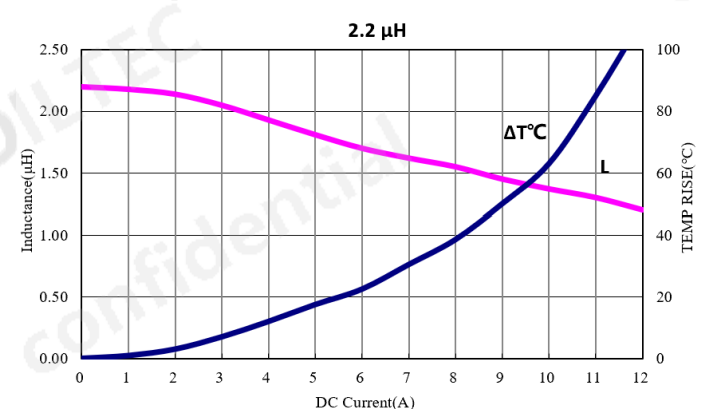
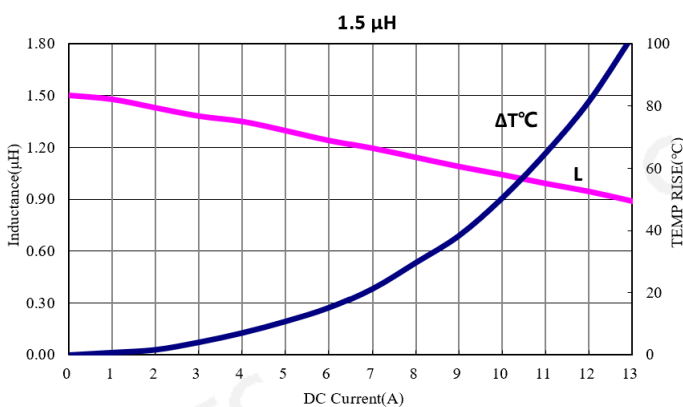
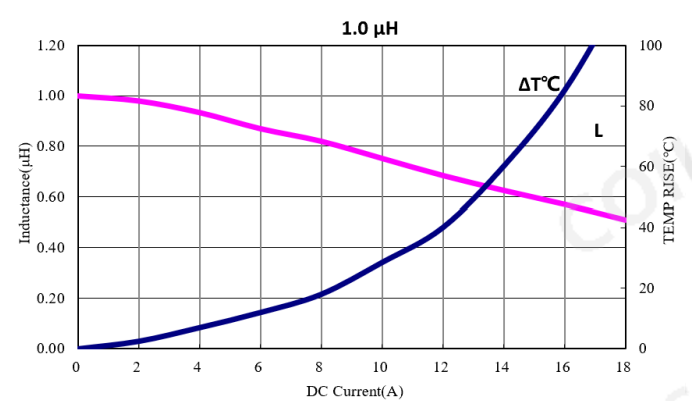
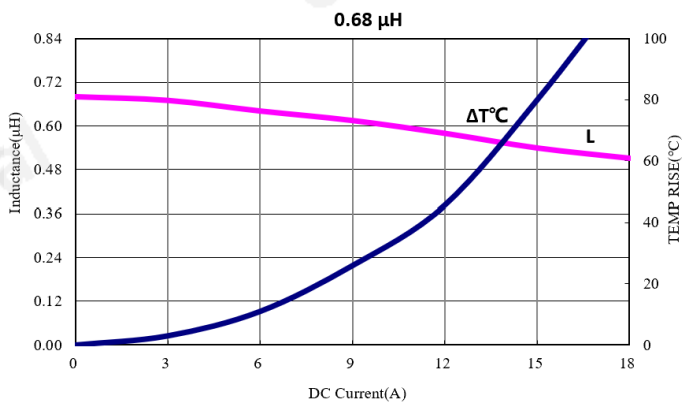
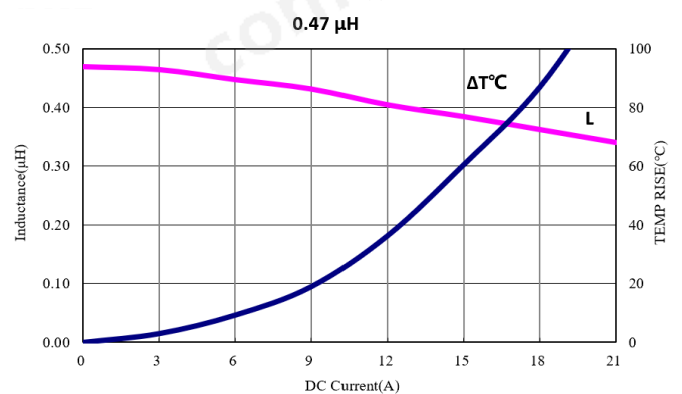
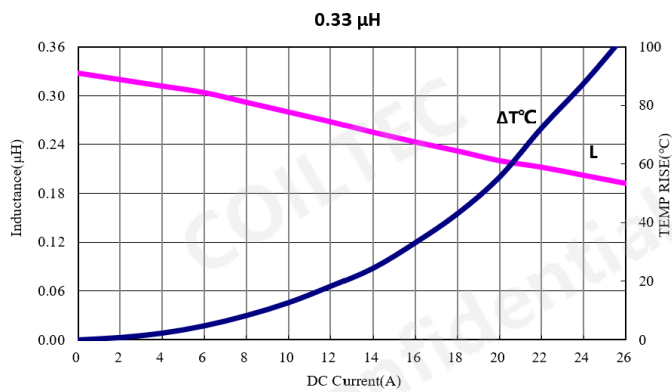
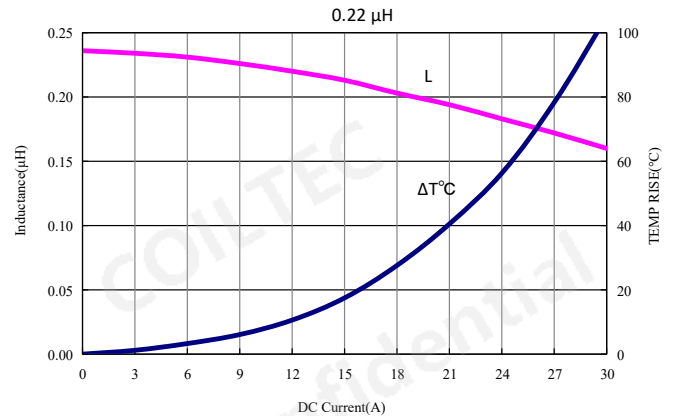
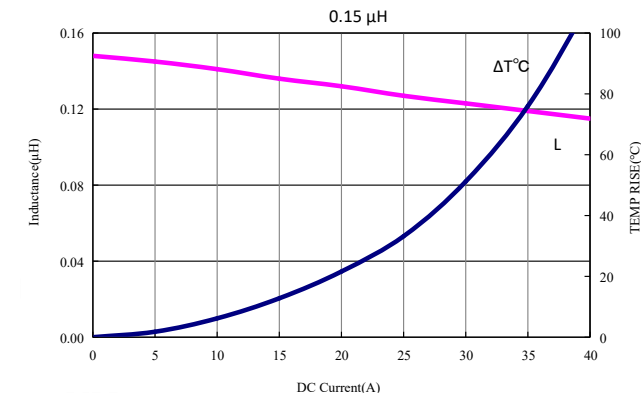
● Specifications

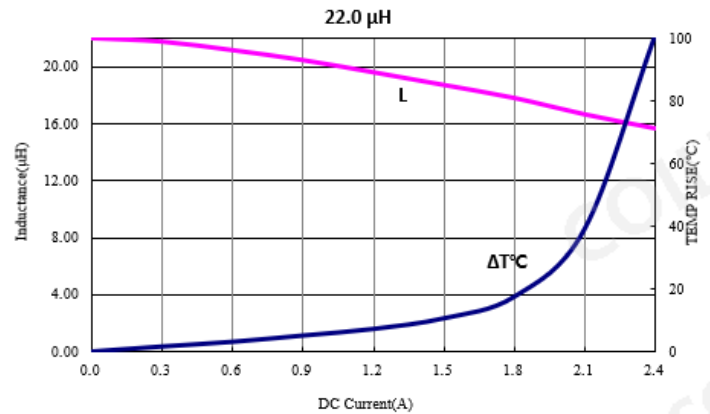
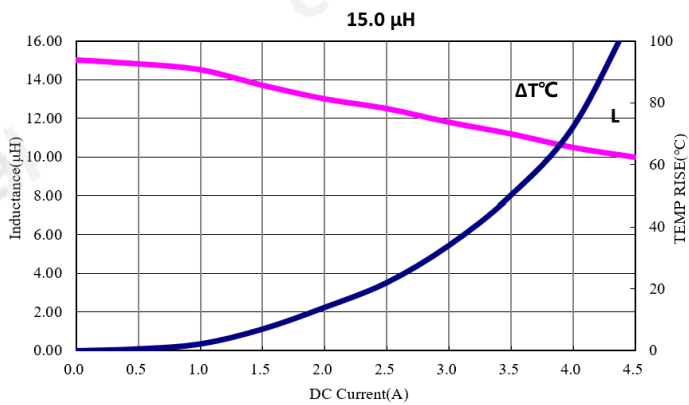
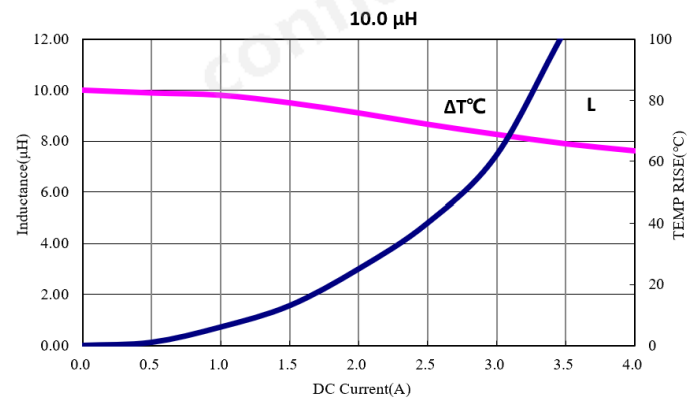
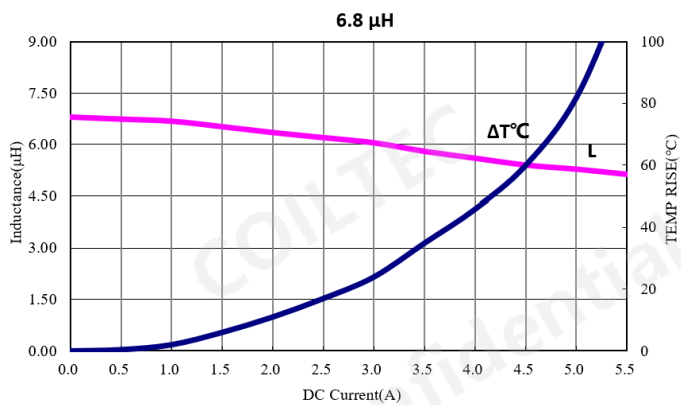
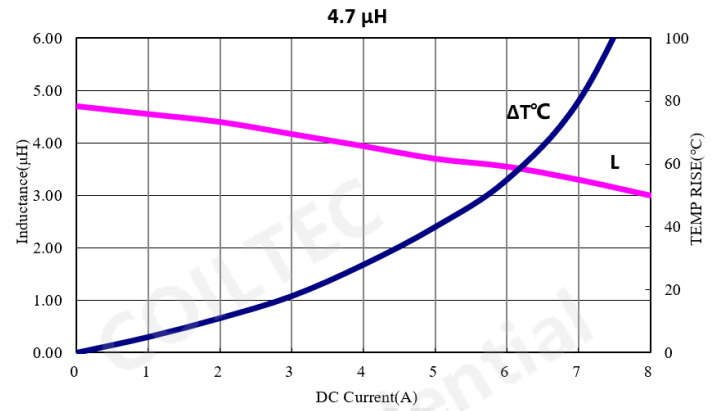
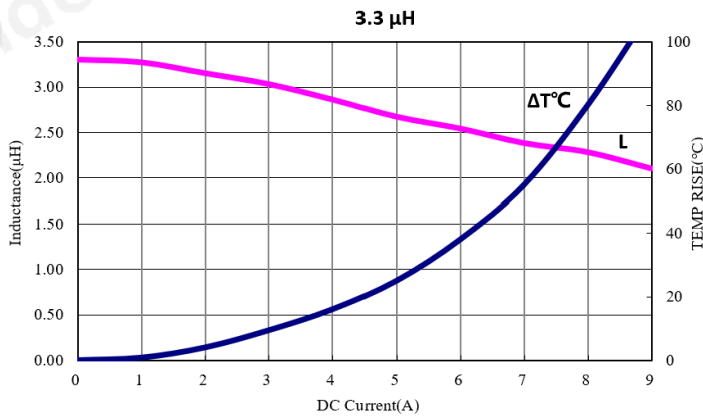
Part Number	L0 Inductance (μ H) @ (0A)	R _{dc} (m Ω)		Heat Rating Current DC Amps. Idc (A)		Saturation Current DC Amps. Isat (A)	
		Typ.	Max.	Typ.	Max.	Typ.	Max.
VCLS0530-R15MT5	0.15	2.5	3.0	23.2	22.0	38.6	37.0
VCLS0530-R22MT5	0.22	3.7	4.3	17.1	15.5	22.4	19.5
VCLS0530-R33MT5	0.33	4.4	4.9	17.0	15.3	11.4	9.8
VCLS0530-R47MT5	0.47	6.8	7.7	12.6	11.4	14.3	12.2
VCLS0530-R68MT5	0.68	8.4	9.5	11.5	10.4	11.9	10.2
VCLS0530-1R0MT5	1.0	9.8	11.3	11.0	9.9	8.2	6.6
VCLS0530-1R5MT5	1.5	15.1	17.3	8.4	7.5	7.2	6.0
VCLS0530-2R2MT5	2.2	19.6	22.5	7.2	6.5	6.4	5.2
VCLS0530-3R3MT5	3.3	32.3	37.2	5.6	5.1	5.6	4.8
VCLS0530-4R7MT5	4.7	50.0	57.8	4.5	4.0	4.6	4.0
VCLS0530-6R8MT5	6.8	78.4	90.2	3.6	3.2	3.6	3.1
VCLS0530-100MT5	10.0	110.0	127.0	2.9	2.6	2.4	2.0
VCLS0530-150MT5	15.0	167.0	192.0	2.4	2.2	2.2	1.9
VCLS0530-220MT5	22.0	246.5	290.0	2.1	1.9	2.1	1.8

NOTES:

1. Inductance Tolerance $\pm 20\%$.
2. Rated Voltage Max. 50V.
3. All test data is referenced to 25°C ambient.
4. Inductance tested at 100 kHz, 1Vrms.
5. Idc : DC current (A) that will cause an approximate ΔT of 40°C
6. Isat : DC current (A) that will cause L0 to drop approximately 25%
7. Operating Temperature Range -55°C to +155°C
8. The part temperature (ambient + temp rise) should not exceed 155°C under the worst case operating conditions. Circuit design, component placement, PCB trace size and thickness, airflow and other cooling provision all affect the part temperature. Part temperature should be verified in the end application.
9. The rated current as listed is either the saturation current or the heating current depending on which value is lower.
10. Cleaning Process Note
 - (a) If this power choke is dipped in the cleaning agent, such as toluene, xylene, ketone, and ether system, there is a possibility that the performance decreases greatly
 - (b) The high power ultrasonic washing may damage the choke body.
 - (c) Please contact us if you need the cleaning via the above agents or ultrasonic washing.

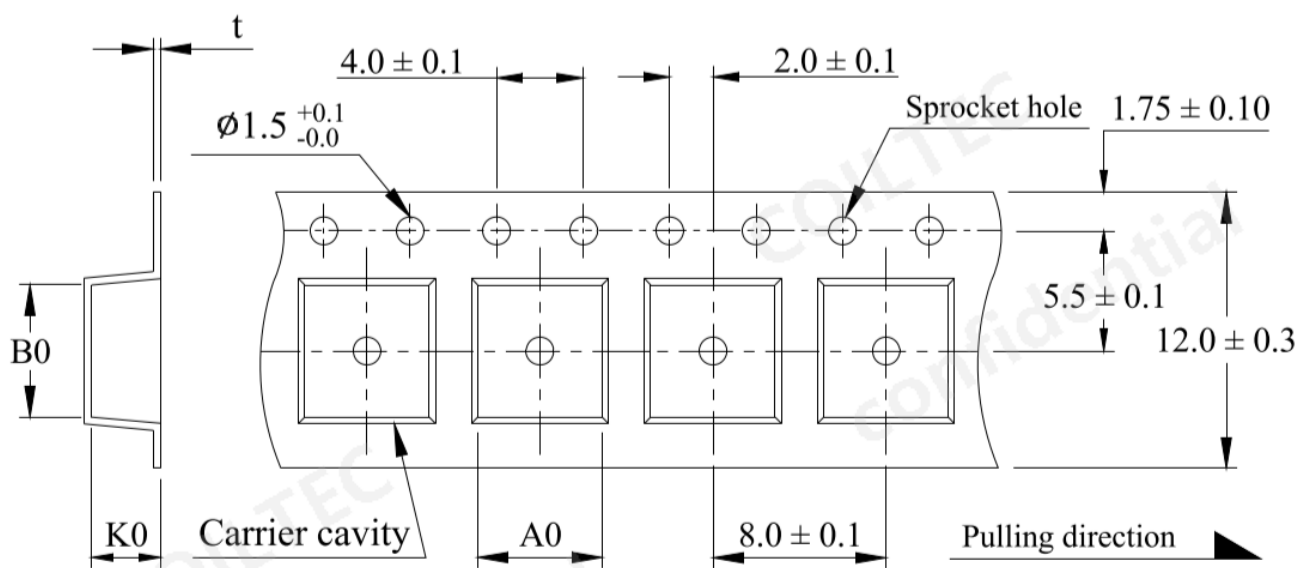
● Performance





● Packaging

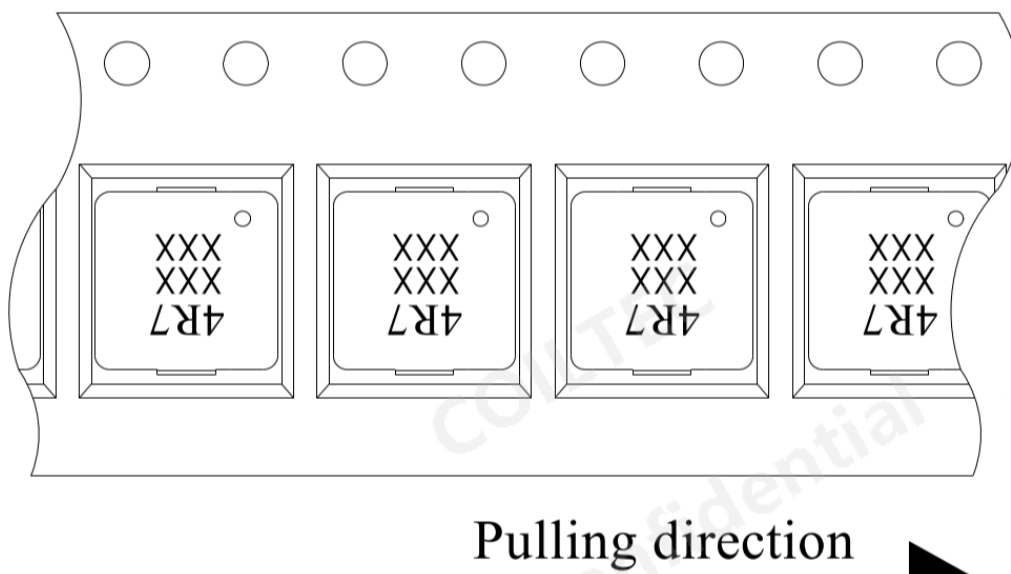
(1) Tape packaging dimensions



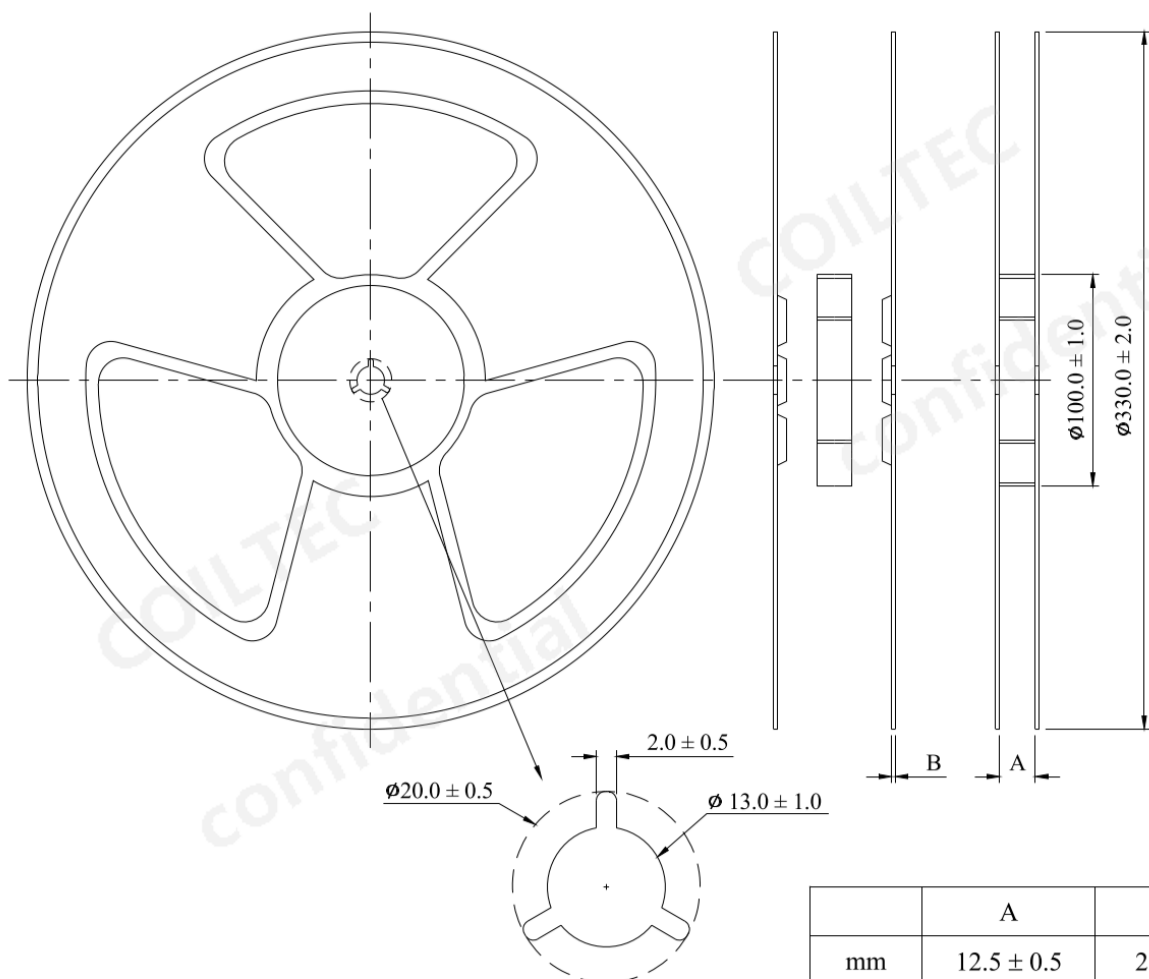
Dimensions Code (mm)				UNITS/REEL
A0	B0	K0	t	
5.75 ± 0.10	6.05 ± 0.10	3.6 ± 0.1	0.35 ± 0.05	2,000

(2) Tape Direction

The direction shall be seen from the top cover tape side.



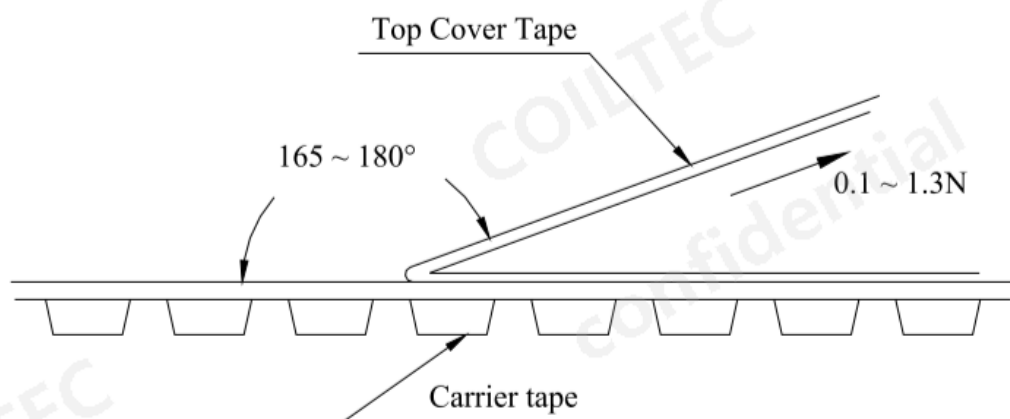
(3) Reel dimensions



(4) Peel force of top cover tape

The peel speed shall be about 300 mm/minute.

The peel force of top cover tape shall be between 0.1 to 1.3N.

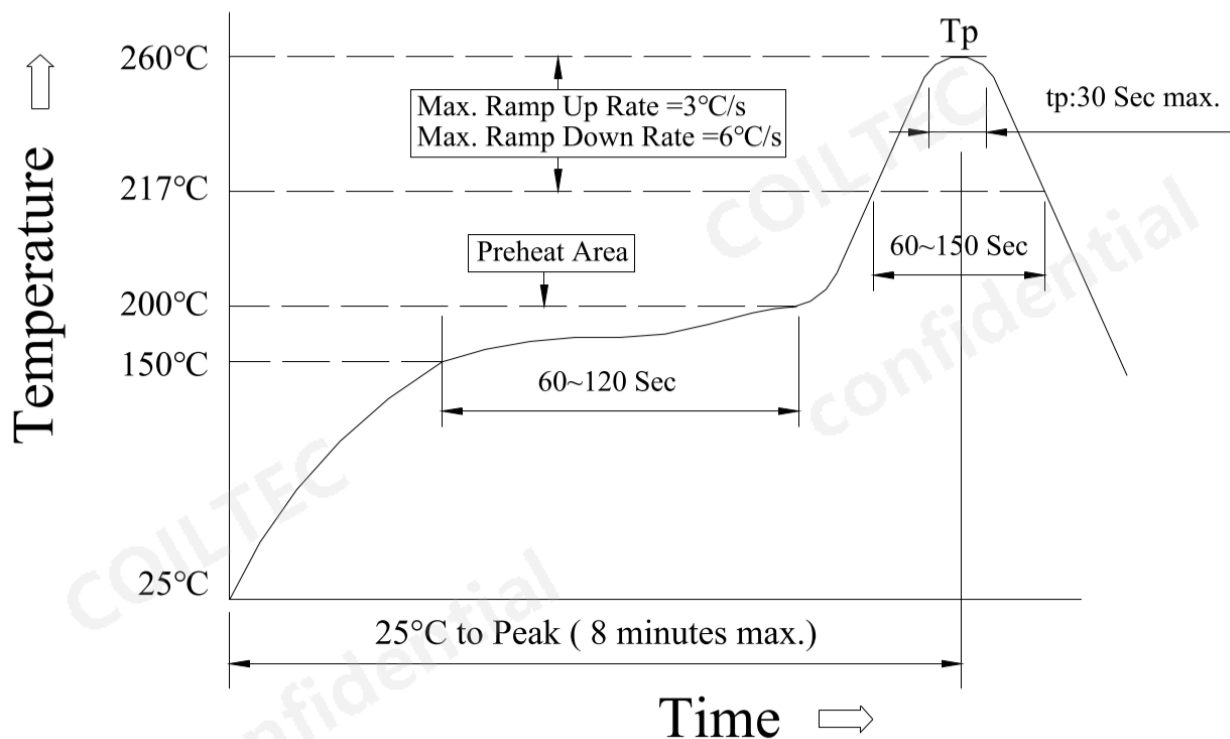


● Reliability

Item No	Item	Reference	Test Method	Spec.
1	External visual	MIL-STD-883 Method 2009	Inspect device construction, marking and workmanship. Pre and Post Electrical Test not required.	No abnormality
2	Physical dimension	JESD22-B100	Verify physical dimensions to the applicable components detail specification. Note: User(s) and Suppliers spec. Pre and Post Electrical Test not required.	No abnormality
3	Electrical characterization	User Spec.	Parametrically test per lot and sample size requirements, summary to show Min,Max,Mean and standard deviation at room as well as Min and Max operating temperatures.	No abnormality
4	High temperature exposure	MIL-STD-202 Method 108	Temperature:155°C Duration:1000hrs	$\Delta L \leq \pm 10.0\%$ Without mechanical damage such as break.
5	Temperature cycling	JESD22-A104	1000 cycles(-55°C to +155°C) Measurement at 24±4 hrs. after test conclusion. 30min maximum dwell time at each temperature extreme. 1 min. maximum transition time.	$\Delta L \leq \pm 10.0\%$ Without mechanical damage such as break.
6	Biased humidity	MIL-STD-202 Method 103	1000hrs.85°C/85%RH. Unpowered. Measurement at 24±4 hrs. after test conclusion.	$\Delta L \leq \pm 10.0\%$ Without mechanical damage such as break.
7	Operational life	MIL-STD-202 Method 108	1000hrs.@115°C, rated current Measurement at 24±4 hrs. after test conclusion.	$\Delta L \leq \pm 10.0\%$ Without mechanical damage such as break.
8	Resistance to soldering heat	MIL-STD-202 Method 210	Magnifications 10X. 260°C 10seconds	$\Delta L \leq \pm 10.0\%$ Without mechanical damage such as break.
9	Solderability	J-STD-002	Magnifications 10X. Conditions: SMD type Method B1 @245°C	The surface of terminal immersed shall be minimum of 95% covered with a new coating of solder

Item No	Item	Reference	Test Method	Spec.
10	Mechanical shock	MIL-STD-202 Method 213	100g ,6ms, 3time/direction, using a half-sine waveform	$\Delta L \leq \pm 10.0\%$ Without mechanical damage such as break. The components do not fall off.
11	Vibration	MIL-STD-202 Method 204	Test from 10-2000Hz 5g for 20minutes,12cycles/axis a total of 4 hours/axis	$\Delta L \leq \pm 10.0\%$ Without mechanical damage such as break. The components do not fall off.
12	Board flex	AEC-Q200-005	2mm for 60 seconds minimum holding time.	$\Delta L \leq \pm 10.0\%$ Without mechanical damage such as break. Electrode is not broken
13	Terminal strength	AEC-Q200-006	Shear force:1.8kg, duration:60 +1seconds.	$\Delta L \leq \pm 10.0\%$ Without mechanical damage such as break. Electrode is not broken
14	Resistance to solvents	MIL-STD-202 Method 215	Solvent: Add OKEM clean or equivalent Immersion 3+0.5/-0 minutes, brush 10 strokes (wet bristle)2 to 3 oz., 3 times.	$\Delta L \leq \pm 10.0\%$ No cracks, separations, crazing, swelling, softening and degradation of body material
15	ESD	AEC-Q200-002	Direct Contact Discharge: 6KV Air Discharge:12KV ->16KV ->25KV	$\Delta L \leq \pm 10.0\%$ Without mechanical damage such as break.

● Reflow Profile



(1) Reflow Soldering Method :

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

(2) Soldering iron Method : 350±5°C max.3 seconds