佳邦科技股份有限公司
INPAQ TECHNOLOGY CO., LTD.

VEFL2C0530-MPA Series

Data Sheet

Product Name	**VEFL2C0530-MPA Series**
Series	**Molding Power Inductor**
Size	**0530**
Version	**A0**

Molding Power Inductor

Scope

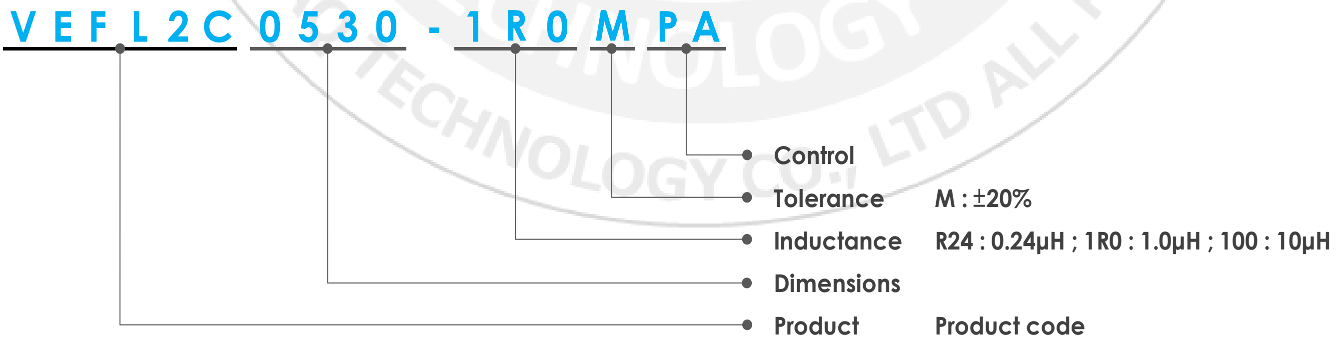
Features

- AEC-Q200 qualified
- Moisture Sensitivity Level (MSL): 1
- Thickness max. 3mm.
- Flux shielded structure, low radiation.
- High saturation current realized by coil design and alloy powder.
- Low power loss and temperature rising realized by low DC Resistance.
- Low AC loss realized by powder, binder and structure design.

Applications

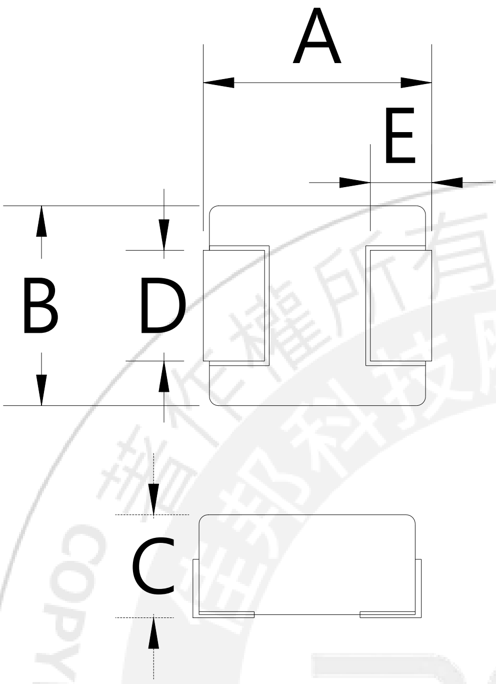
- 5G
- Infotainment
- Server / Industry / VGA
- Desktop / NB / MB
- DC/DC converters for entertainment / navigation systems / power delivery

Explanation of Part Number



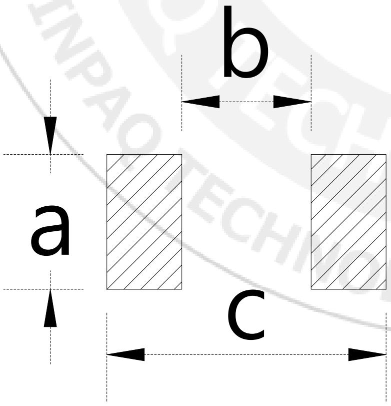
Control	
Tolerance	M : ±20%
Inductance	R24 : 0.24μH ; 1R0 : 1.0μH ; 100 : 10μH
Dimensions	
Product	Product code

Dimensions



Code	Dimensions[mm]
A	5.7 ± 0.3
B	5.4 ± 0.3
C	3.0 max.
D	2.1 ± 0.2
E	1.5 ± 0.3

Recommended land pattern



Code	Dimensions[mm]
A	2.5
B	1.9
C	6.8

Marking

The inductor is marked with a 3-digit code (using ink for marking).

Example:
R24 means 0.24μH
1R0 means 1.0μH
100 means 10μH

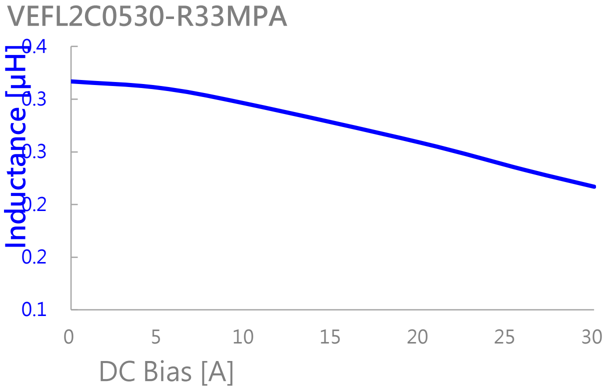
Specifications

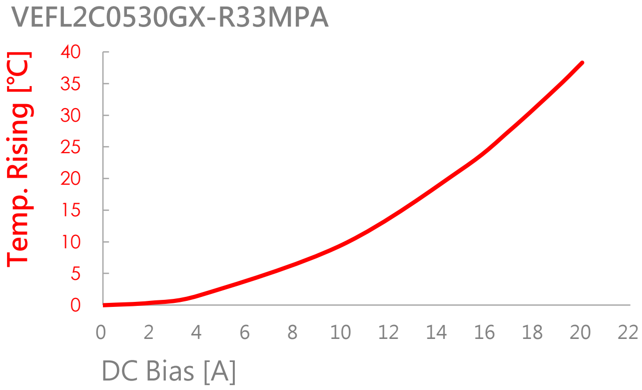
05xx Series PN	Li [μH]	Rdc [mΩ]		Isat [A]		Irms [A]	
	Initial Value	DC resistance		Li drop 30%		Temp. rising 40°C	
	±20%	typ.	max.	typ.	max.	typ.	max.
VEFL2C0530-R33MPA	0.33	3.4	3.6	26	23.4	19.2	17.3
VEFL2C0530-R68MPA	0.68	5.8	6.5	22	19.8	14.5	13.8
VEFL2C0530-1R0MPA	1	7.2	8.5	17	14	11.1	10.5
VEFL2C0530-2R2MPA	2.2	13.2	14.5	11	9.2	9.7	9.2
VEFL2C0530-3R3MPA	3.3	20	23	10.5	8.7	8.1	7.7
VEFL2C0530-4R7MPA	4.7	29.5	35.5	8.5	6.8	5.9	5.6

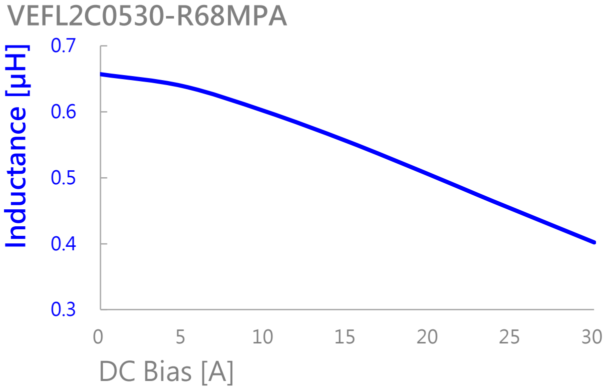
Notes

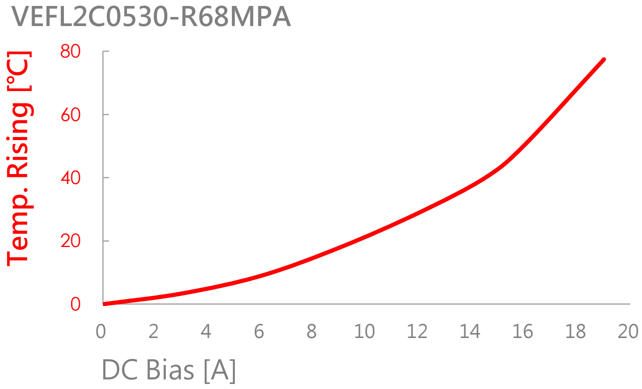
1. Test environment of all data is referenced to 25°C ambient.
2. Test conditions: 1MHz, 1Vrms.
3. Isat : DC current (A) that will cause L to drop approximately 30%.
4. Irms : DC current (A) that will cause an approximate ΔT of 40°C(reference ambient temperature is 25°C).
5. Operating temperature range – 40°C to +125°C.
6. The part temperature (ambient + temp rise) should not exceed 125°C under worst case operating conditions. PCB land pattern, trace size - thick, circuit design and proximity to other components are all the factors will affect the temperature performance of the device. Therefore should be approved in application conditions and end product.
7. Rdc Measured with DC resistance meters RM3543(HIOKI) or equivalent.

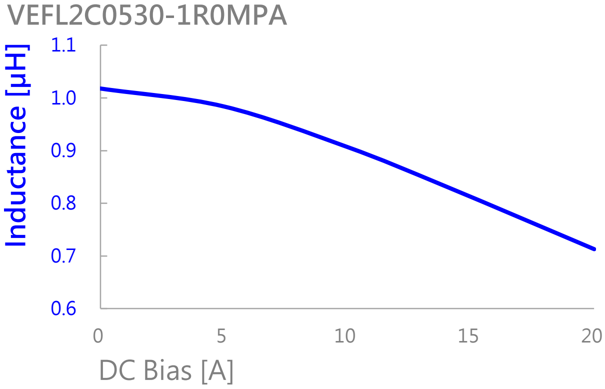
Typical Performance Curves

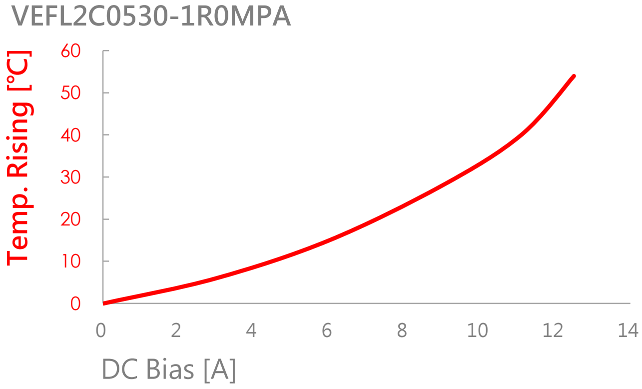


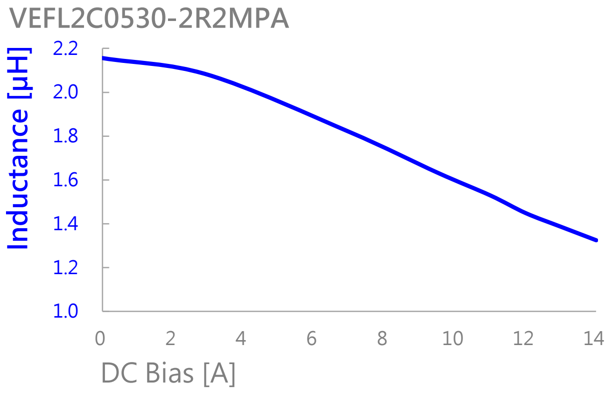


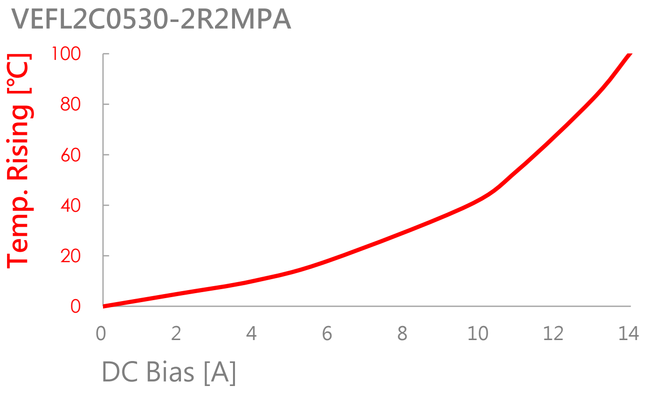


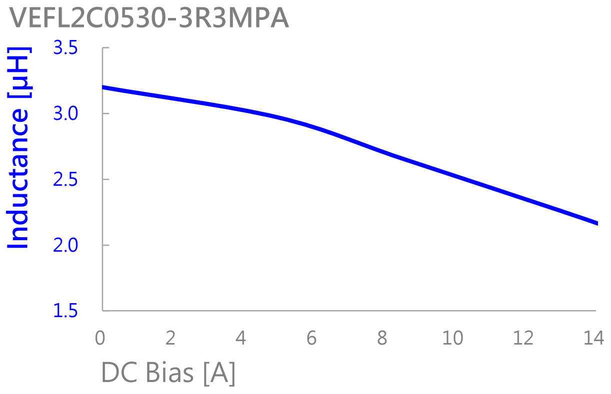







VEFL2C0530-2R2MPA
Inductance [μH]
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0
2
4
6
8
10
12
14
DC Bias [A]


VEFL2C0530-2R2MPA
Temp. Rising [°C]
100
80
60
40
20
0
0
2
4
6
8
10
12
14
DC Bias [A]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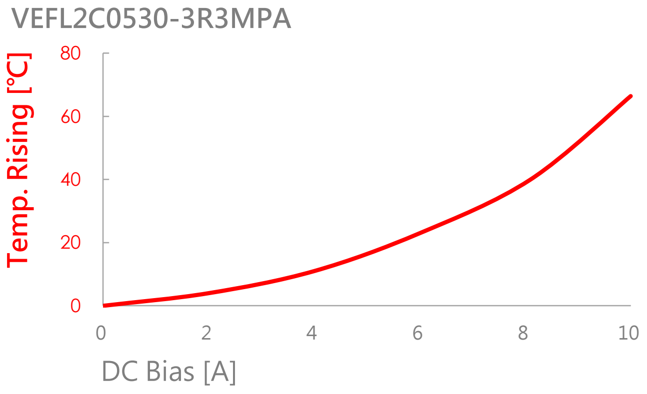
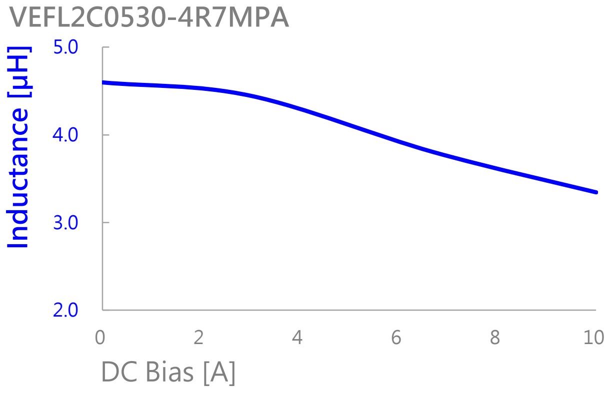
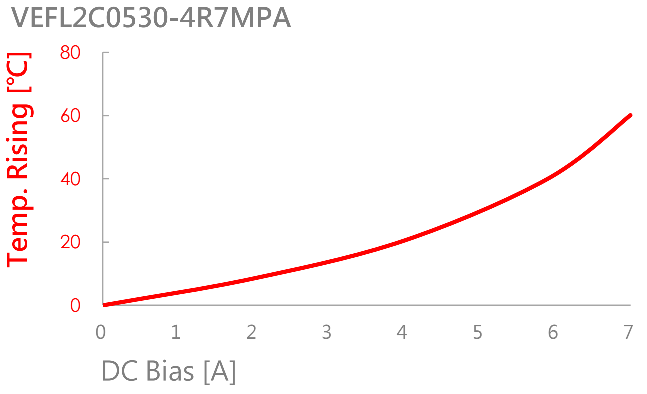
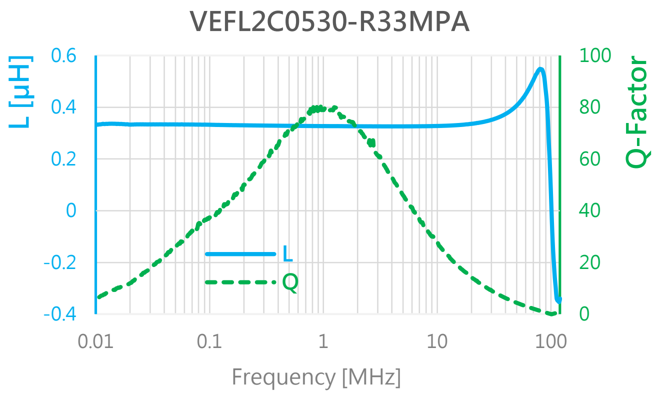
Inductance [μH]
3.5
3.0
2.5
2.0
1.5
0
2
4
6
8
10
12
14
DC Bias [A]

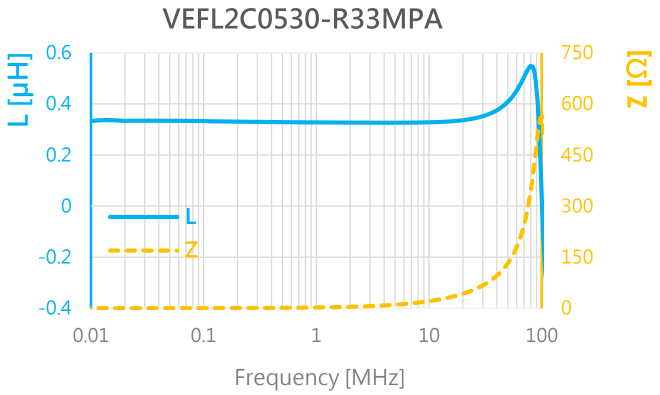

VEFL2C0530-3R3MPA
Temp. Rising [°C]
80
60
40
20
0
0
2
4
6
8
10
DC Bias [A]

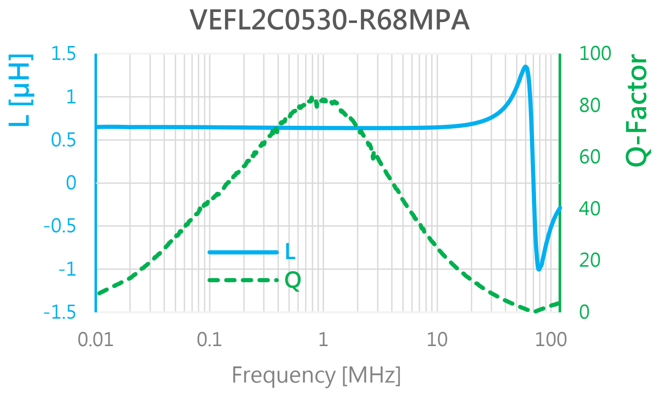

VEFL2C0530-4R7MPA
Inductance [μH]
5.0
4.0
3.0
2.0
0
2
4
6
8
10
DC Bias [A]

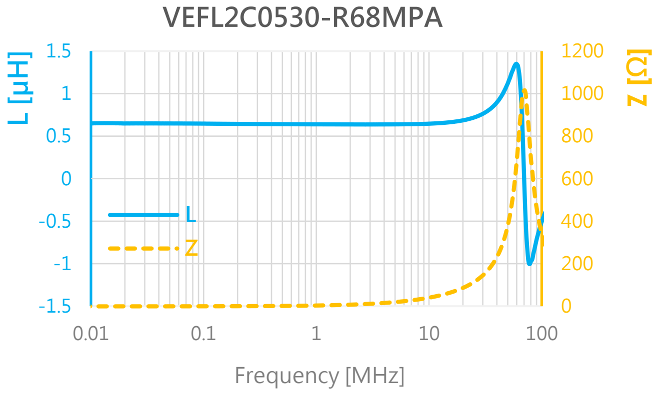

VEFL2C0530-4R7MPA
Temp. Rising [°C]
80
60
40
20
0
0
1
2
3
4
5
6
7
DC Bias [A]

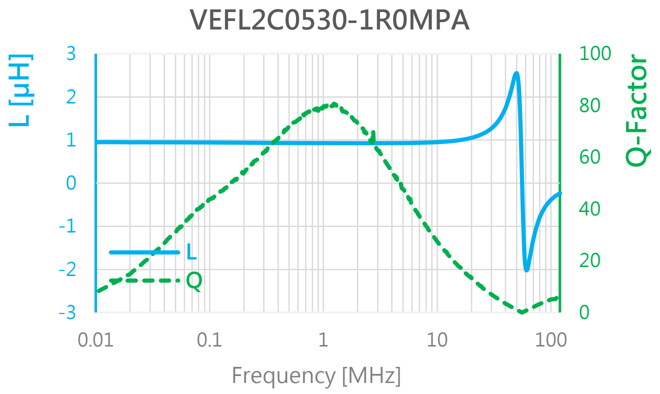
Inductance and Q vs. Frequency

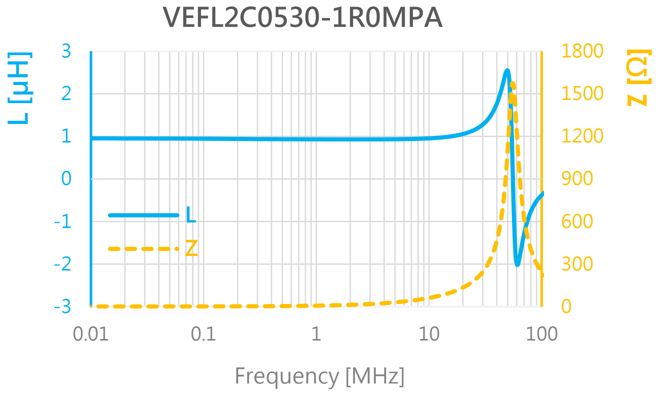


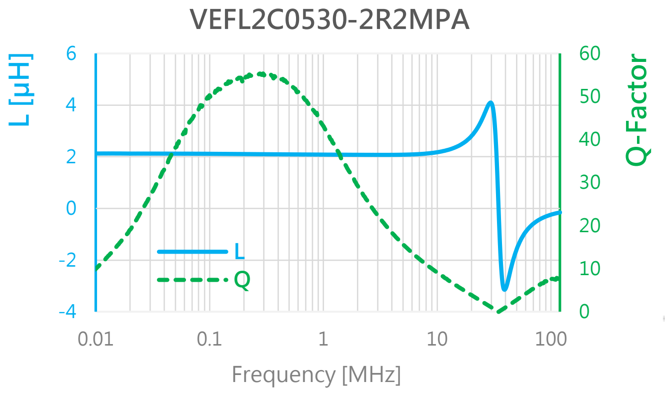








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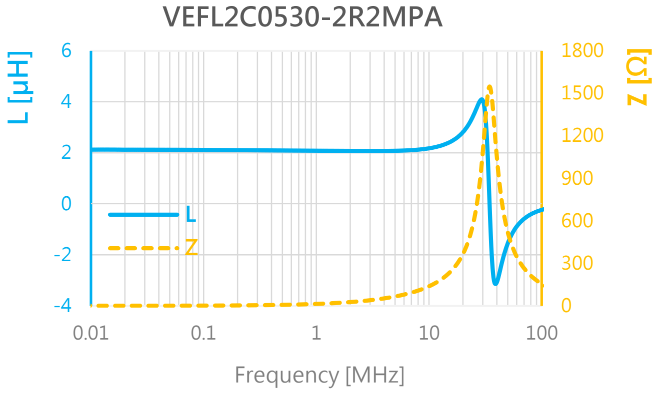
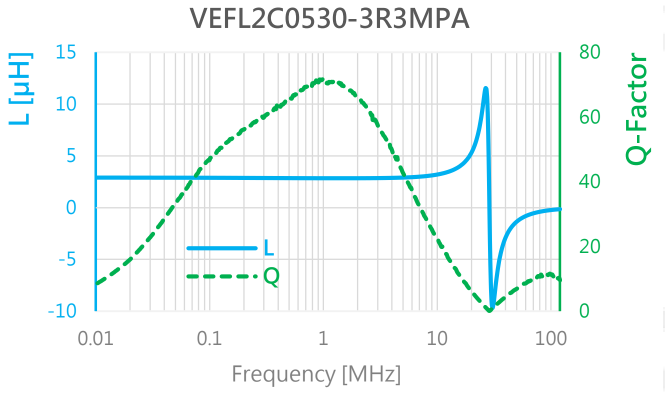
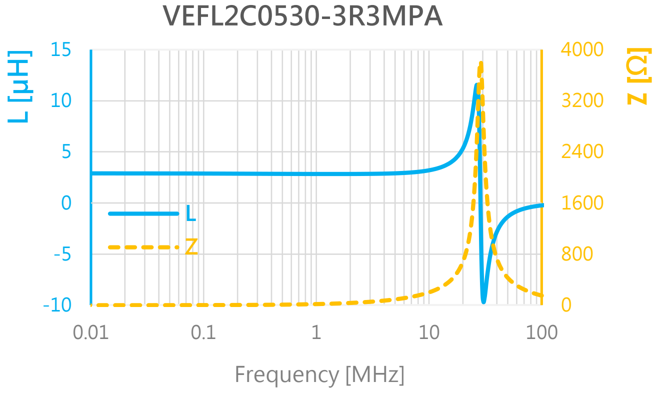
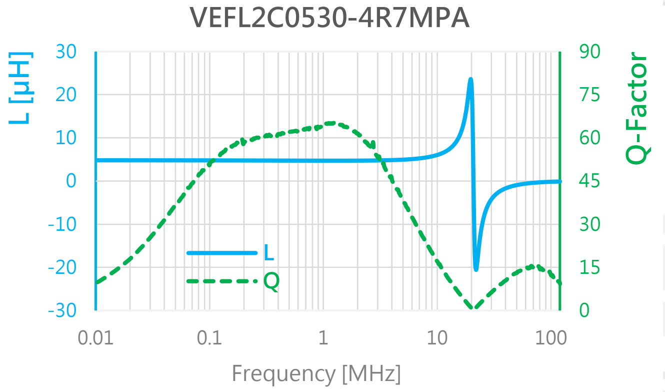
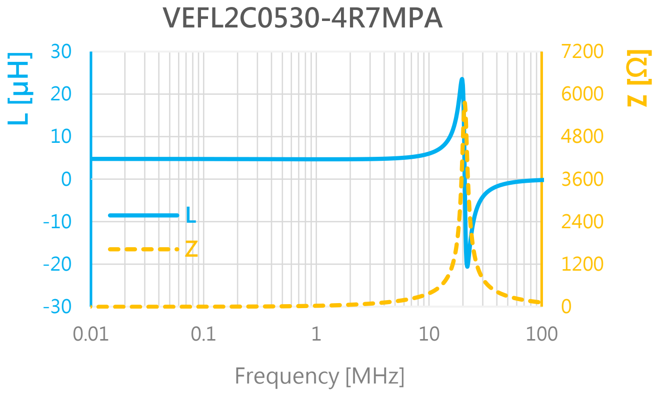

VEFL2C0530-2R2MPA


VEFL2C0530-3R3MPA


VEFL2C0530-3R3MPA


VEFL2C0530-4R7MPA


VEFL2C0530-4R7MPA

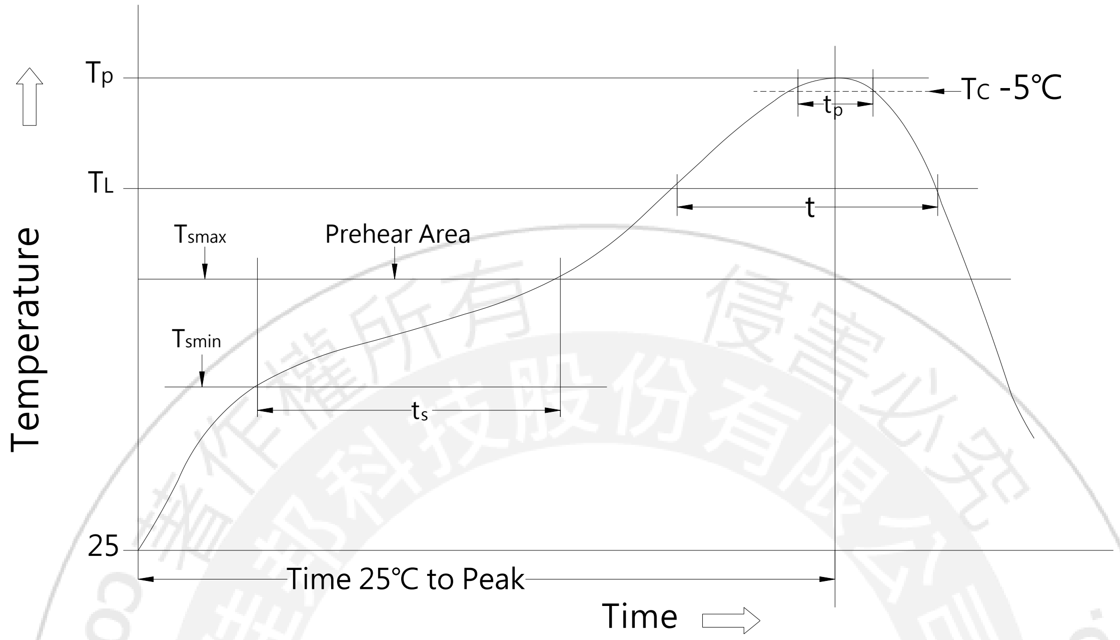
Reliability and Test Condition

AEC-Q200 Test Item	AEC-Q200 Test Condition	SPECIFICATION
High Temperature Exposure (Storage) MIL-STD-202 Method 108	* Test temp.: 125±2°C * Test time: 1000+24/-0 hrs. * Measurement to be made after keeping at room temp. for 24±2 hrs.	* Inductance change is less than ±15%. * RDC change is less than ±10%. * Without obvious appearance damage.
Temperature Cycling JESD22 Method JA-104	* 1000 cycles (-40°C to +125°C). * Transition time: 1 min max. * Measurement to be made after keeping at room temp. for 24±2 hrs.	* Inductance change is less than ±15%. * RDC change is less than ±10%. * Without obvious appearance damage.
Biased Humidity MIL-STD-202 Method 103	* Test temp.: 85±2°C * Humidity: 85%RH * Test time: 1000+24/-0 hrs. * Measurement to be made after keeping at room temp. for 24±2 hrs.	* Inductance change is less than ±15%. * RDC change is less than ±10%. * Without obvious appearance damage.
Operational Life MIL-PRF-27	* Test temp.: 85±2°C * To apply current until the surface temperature reaches +125°C * Test time: 1000+24/-0 hrs. * Measurement to be made after keeping at room temp. for 24±2 hrs.	* Inductance change is less than ±15%. * RDC change is less than ±10%. * Without obvious appearance damage.
External Visual MIL-STD-883 Method 2009	* Visual inspection	* Without obvious appearance damage.
Physical Dimension JESD22 Method JB-100	* Using by caliper	* Within the specified dimensions.

AEC-Q200 Test Item	AEC-Q200 Test Condition	SPECIFICATION
Resistance to Solvents MIL-STD-202 Method 215	* Temperature: 25±5°C * Time: 3+0.5/-0 min. * Solvent: Iso-propyl alcohol	* Inductance change is less than ±15%. * RDC change is less than ±10%. * Without obvious appearance damage.
Terminal Strength AEC-Q200-006	* Pressurizing force：20N * Test time: 60±1 sec.	* Inductance change is less than ±15%. * RDC change is less than ±10%. * Without obvious appearance damage.
Mechanical Shock MIL-STD-202 Method 213	* Condition C * Peak value: 100g's. * Wave: 1/2 sine. * Velocity: 12.3 ft/sec. * Three shocks in each direction should be applied along 3 mutually perpendicular axes of the test specimen. (18 shocks)	* Inductance change is less than ±15%. * RDC change is less than ±10%. * Without obvious appearance damage.
Vibration MIL-STD-202 Method 204	* Vibration frequency: 10~2000 Hz/min. (5g's for 20 min) * Total amplitude: 1.5mm * 12 cycles each of 3 orientations. (36 times)	* Inductance change is less than ±15%. * RDC change is less than ±10%. * Without obvious appearance damage.
Resistance to Soldering Heat MIL-STD-202 Method 210	* Condition B * Solder temperature: 260±5°C * Dipping time: 10±1 sec. * Measurement to be made after keeping at room temp. for 24±2 hrs.	* Inductance change is less than ±15%. * RDC change is less than ±10%. * Without obvious appearance damage.

AEC-Q200 Test Item	AEC-Q200 Test Condition	SPECIFICATION
ESD AEC-Q200-002	* Per AEC-Q200-002.	* Inductance change is less than ±15%. * RDC change is less than ±10%. * Without obvious appearance damage.
Solderability J-STD-002	* Condition C Un-mounted chips steam 8 hrs. then completely immersed for 10±1 sec. in solder bath at 260+0/-5°C.	* New solder shall covered with 95 % minimum on the surface.
Board Flex AEC-Q200-005	* The middle part of substrate shall be pressurized by means of the pressurizing rod at a rate of about 1 mm per second until the deflection becomes 2mm and then the pressure shall be maintained for 60±1 sec. * Measurement to be made after keeping at room temp. for 24±2 hrs.	* Inductance change is less than ±15%. * RDC change is less than ±10%. * Without obvious appearance damage.

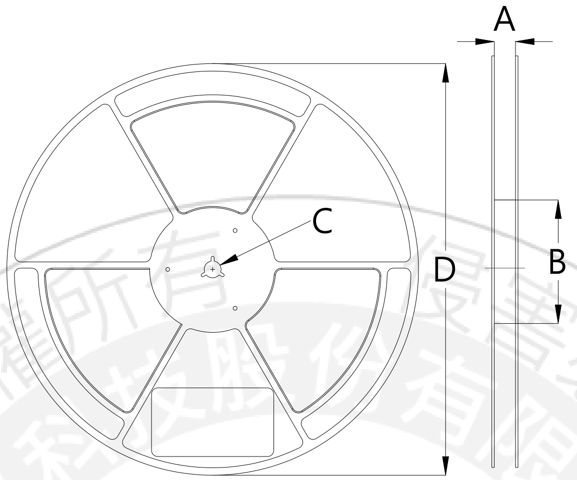
Recommendable Reflow Soldering



Profile Feature	Pb-Free Assembly
Preheat - Temperature Min(T_{smin}) - Temperature Max(T_{smax}) - Time (t_s) from (T_{smin} to T_{smax})	150°C 200°C 60-120 seconds
Ramp-up rate (T_L to T_P)	3°C / second max.
Liquidous temperature(T_L) Time (t) maintained above T_L	217°C 60-150 seconds
Peak package body temperature(T_P)	260°C +0/-5°C
Time within 5°C of actual peak temperature(t_p)	10-30 seconds
Ramp-down rate (T_P to T_L)	6°C / second max.
Time 25°C to peak temperature	8 minutes max.
Number of Reflow cycles allowed	2 cycles max.

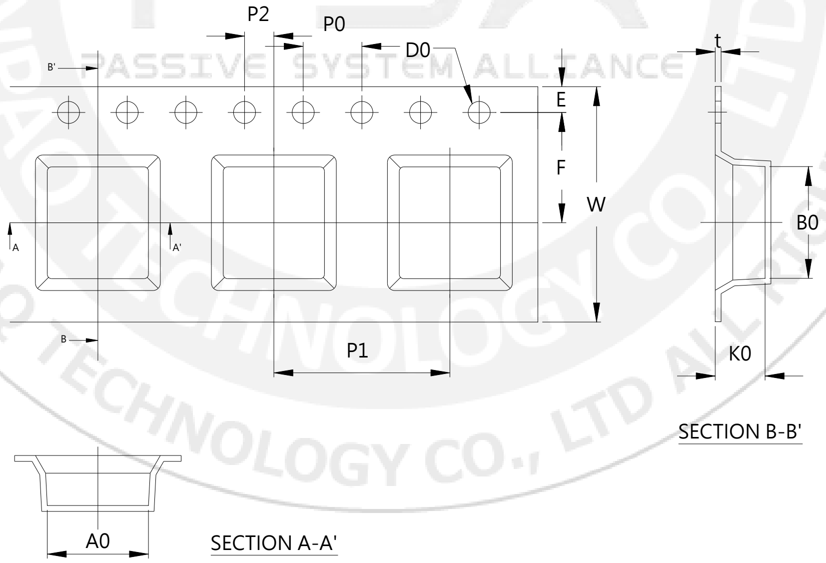
Tape & Reel

▶ Reel dimensions (unit: mm)



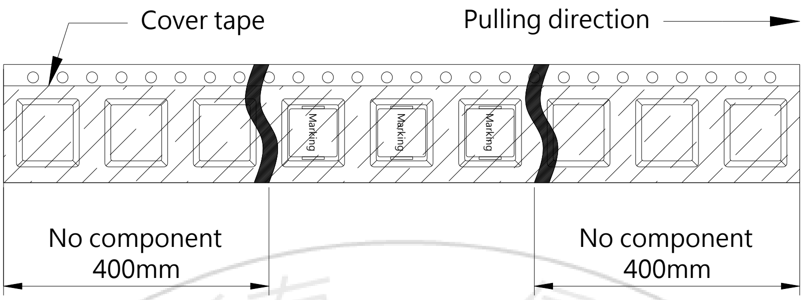
Type	A	B	C	D
13'x12	13±0.2	100±0.2	13+0.3/-0.1	330±1.0

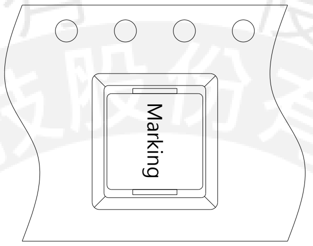
▶ Tape dimensions (unit: mm)



Type	W	P1	P0	P2	D0	t	A0	B0	K0	E	F
VEFL2C0530	12 ±0.3	8 ±0.1	4 ±0.1	2 ±0.1	1.5 +0.1	0.35 ±0.05	5.7 ±0.1	5.9 ±0.1	3.25 ±0.1	1.75 ±0.1	7.5 ±0.1

▶ Taping Drawings





Component tape direction

▶ Taping Package Storage Condition

Storage Temperature: 5 to 40°C
Relative Humidity: < 65%RH
Storage Time: 12 months max

▶ Label Marking

The label specified as follows shall be put on the side of reel.

(1) Part No.
(2) Quantity.
(3) Lot No.

* Part No. And Quantity shall be marked on outer packaging.

▶ Quantity of products in the package

Type	Reel
VEFL2C0530	2000