Version record (Darfon)

Ver.	Description of change	Owner	Release Date
0		Dora Chou	2017.3.22

Ordering code(Example)

① ② ③ ④ ⑤ ⑥

SPH XXXX XXX X XX X

① Product Code

② Size (LxW, mm)

③ Inductance：

R22=0.22μH 2R2=2.2μH

220=22μH 221=220μH

④ Tolerance

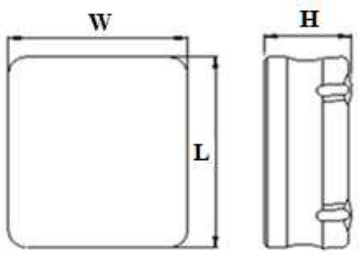
M= ± 20%, T= ± 25%, N= ± 30%

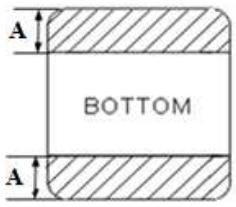
⑤ Material Type

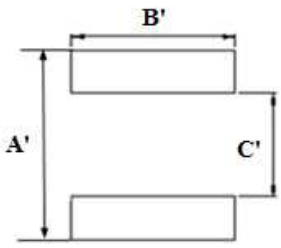
⑥ Thickness (mm)

Code	Thick	Code	Thick	Code	Thick	Code	Thick
3	0.3	A	1.0	H	2.0	P	4.5
4	0.4	B	1.1	I	2.4	Q	5.0
5	0.5	C	1.2	J	2.5	R	6.0
6	0.6	D	1.4	K	2.8	S	6.5
7	0.7	E	1.5	L	3.0	T	2.6
8	0.8	F	1.6	M	3.5	U	7.0
9	0.9	G	1.8	N	4.0	V	9.0

1. Mechanical dimensions (mm)







Recommended Land Patterns

Code	L	W	H	A	A'	B'	C'
Dimensions	2.5 ± 0.3	2.0 ± 0.3	$1.2^{+0.1}_{-0.2}$	0.85 ± 0.2	2.6	2.1	0.8

2.Electrical specification

Darfon No.	Inductance L (uH)	Tolerance	DC Resistance (mΩ)		Heat Rating Current DC Amps. Idc(A)		Saturation Current DC Amps. Isat(A)		Marking
			Typ.	Max.	Typ.	Max.	Typ.	Max.	
SPH2520R24NPSC	0.24	± 30%	26	31	4.50	4.00	4.80	4.50	—
SPH2520R47NPSC	0.47	± 30%	29	35	3.70	3.30	3.90	3.50	—
SPH2520R50NPSC	0.50	± 30%	32	38	3.60	3.24	3.80	3.40	—
SPH2520R68NPSC	0.68	± 30%	54	65	3.24	2.70	3.60	3.40	—
SPH25201R0NPSC	1.0	± 30%	43	52	2.60	2.34	2.70	2.45	—
SPH25201R5MPSC	1.5	± 20%	72	86	2.20	1.98	2.30	2.07	—
SPH25202R2MPSC	2.2	± 20%	90	108	1.85	1.75	2.15	1.95	—
SPH25203R3MPSC	3.3	± 20%	155	186	1.45	1.31	1.70	1.60	—
SPH25204R7MPSC	4.7	± 20%	212	254	1.20	1.08	1.50	1.40	—
SPH25206R8MPSC	6.8	± 20%	370	444	1.00	0.90	1.15	1.04	—
SPH2520100MPSC	10.0	± 20%	750	900	0.75	0.68	0.85	0.77	—

■ NOTES

2-1 Test Frequency : 1MHz , 1.0V

2-2 All test data is referenced to 25℃ ambient .

2-3 Operating Temperature Range -40℃ to + 125℃ .

The part temperature (ambient + temp rise) should not exceed 125℃ under worse case operating conditions. Circuit design , component placement, PWB trace and thickness, airflow and other cooling provision all the part temperature. Part temperature should be verified in the end application.

2-4 Idc(Irms) : DC current (A) that will cause an approximate △T of 40℃ .

2-5 Isat : DC current (A) that will cause L to drop approximately 30% .

2-6 Test Instrument : Inductance(CH-3302+CH-1320);Rdc(CH 16502)

※ Caution Temperature Rise

Temperature rise of this inductor depends on the installed board condition.

It shall be confirmed in the actual end product that temperature rise of inductor is within operation temperature.

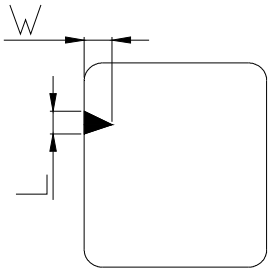
2-7 Weight=0.028 ± 0.01 g

3. Appearance definition

3-1 Core chipping

The appearance standard of the chipping size in top side, of bottom side ferrite core is following dimension.

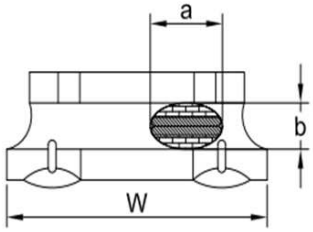
L	W
0.5mm Max	0.5mm Max



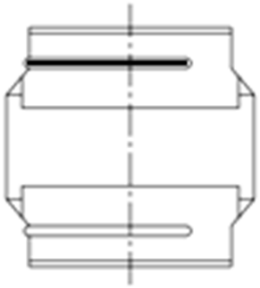
3-2 Void appearance tolerance limit

Size of voids occurring to coating resin is specified below.

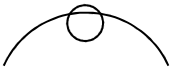
1) Width direction(i.e. a) : Acceptable when a ≦w/2
   Nonconforming when a > w/2
2) Length direction(i.e. b) : Dimension b is not specified.
3) When total area of voids (including one exposing coil) occurring to each sides is not greater than 50% of coating resin area, that is acceptable.



3-3 Electrode appearance criterion for exposed wire



Cross section of wire joint part



Only top side wire is exposed. (regardless of whole top side of wire exposed)



Wire is soldered insufficiently and less than half of outer diameter is covered with solder.

Appearance judgment

less than 1/2 of joint side length is good.

More than 1/2 is selected as defect

4. Precaution

4-1 Handling

- Keep the products away from all magnets and magnetic objects.
- Be careful not to subject the products to excessive mechanical shocks.
- Please avoid applying impact to the products after mounted on pc board.
- Avoid ultrasonic cleaning

4-2 Storage

To prevent deterioration of the solderability of terminal electrodes and/or the packing materials of the products, please store the products under following storage conditions.

Ambient temperature range +5℃ to 35℃

Humidity 45% to 70% RH .

Even under the ideal storage conditions, solder ability of inductor's electrode deteriorates as time passes, so inductors should be used within 6 months after the delivery time.

5. Reliability

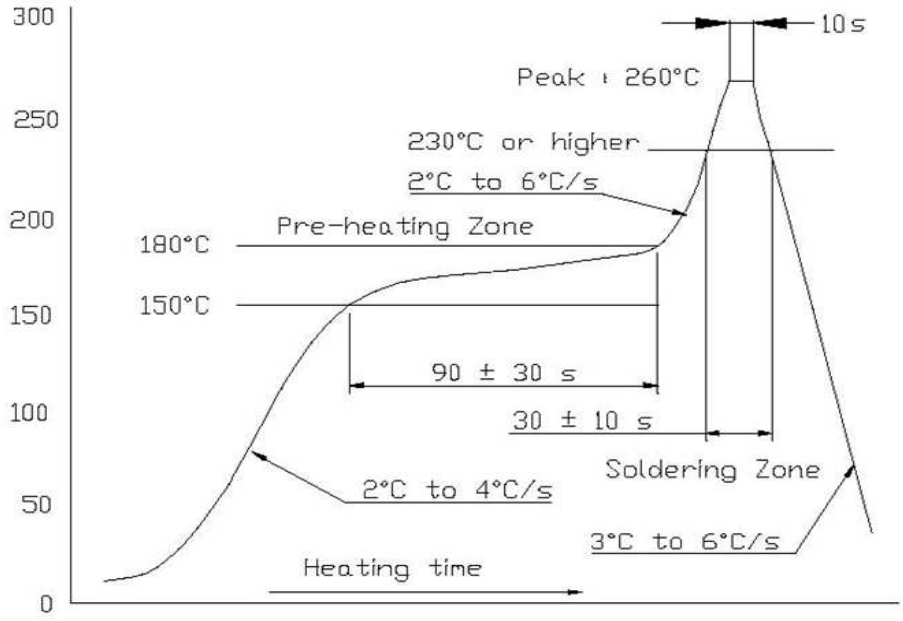
5-1 Mechanical

Item	Specification & Requirement	Test Method
Solder ability	The surface of terminal immersed shall be minimum of 90% covered with a new coating of solder	Solder heat proof : (1) Preheating : 160 ± 10℃ 90s (2) Retention time: 245 ± 5℃ for 3 ± 1 sec
Vibration	1) No mechanical damage. 2) Inductance change within±10%.	(1) Frequency : 10Hz to 55Hz to 10Hz in 60 sec as a period (2) Vibration time : period cycled for 2 hours in each of 3 mutual perpendicular directions (3) Amplitude : 1.5mm max.
Terminal strength	No detachment of terminal pin and no breakage of wire	Add static load 4.9N(500gf) to inductor through hole of test board for 10 ± 2 sec

5-2 Endurance

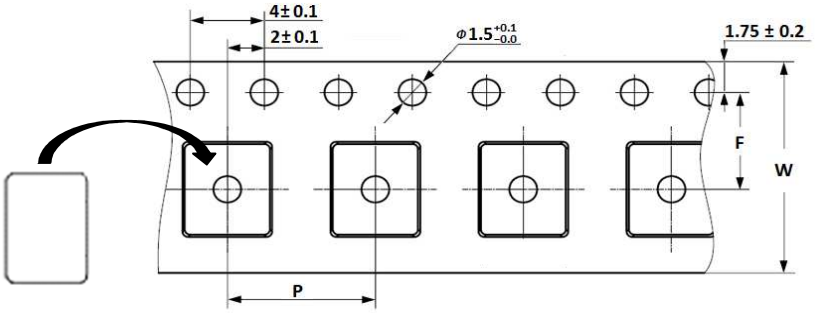
Item	Specification & Requirement	Test Method
Thermal Shock	1) No mechanical damage. 2) Inductance change within±10%.	(1) Repeat 100 cycles as follow : -40℃± 2℃, 30 ± 3 mins →Room temperature , 5 mins →+125℃± 2℃, 30 ± 3 mins →Room temperature , 5 mins (2) Recovery : 48 + 4 / - 0 hours of recovery under the standard condition after the test. (See Note)
High Temperature resistance	1) No mechanical damage. 2) Inductance change within±10%.	(1) Environment condition : 85℃ ± 2℃ Applied Current : Rated current (2) Duration : 500 + 4 / - 0 hours (See Note)
Humidity resistance	1) No mechanical damage. 2) Inductance change within±10%.	(1) Environment condition : 60℃ ± 2℃ Humidity : 90~95% Applied Current : Rated current (2) Duration : 500 + 4 / - 0 hours (See Note)
Low Temperature Storage	1) No mechanical damage. 2) Inductance change within±10%.	(1) Store temperature : -40℃ ± 2℃ (2) Duration : 500 + 4 / - 0 hours
High Temperature Storage	1) No mechanical damage. 2) Inductance change within±10%.	(1) Store temperature :+125℃± 2℃ (2) Duration : 500 +4 / -0 hours
Note : When there are questions concerning measurement result : measurement shall be made after 48 ± 2 hours of recovery under the standard condition.		

6. Reflow profile chart (Reference)



7. Packaging

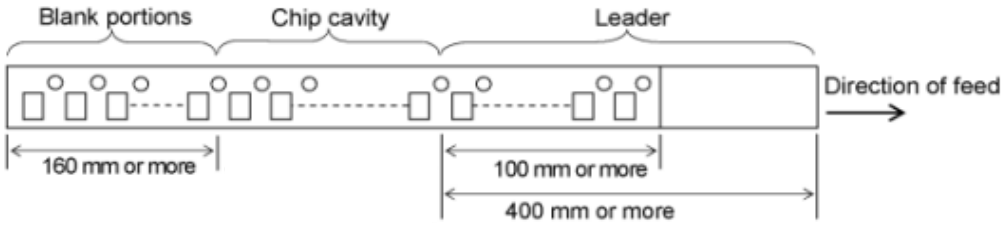
7-1 Dimensions



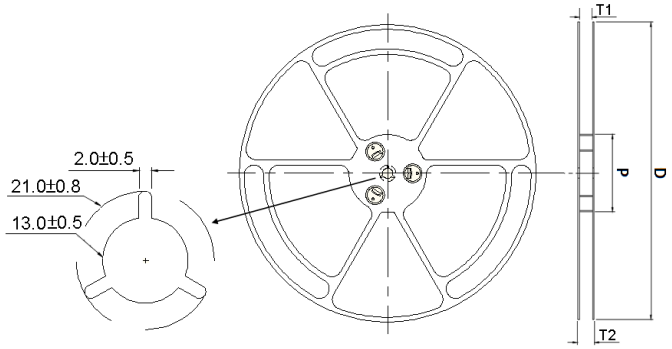
Code	W	P	F
Dimensions	8.0 ± 0.3	4.0 ± 0.3	3.5 ± 0.1

Unit：mm

7-2 Direction of rolling



7-3 Reel



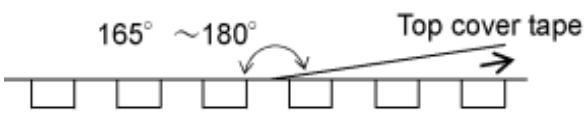
T1	T2
$8.4^{+0.2}_{-0.1}$	$12.4^{\pm 2.0}$
$12.4^{+0.2}_{-0.1}$	$17.0^{\pm 2.0}$
$16.4^{+0.2}_{-0.1}$	$21.0^{\pm 2.0}$
$24.4^{+0.2}_{-0.1}$	$28.4^{\pm 2.0}$

Code	D	P	Quantity(PCS)
Dimensions	180 ± 20	60 ± 10	2000

Unit：mm

The number of empty compartments in a reel , which shall not appear continuously, must be limited to 2.

7-4 Peel force of top cover tape

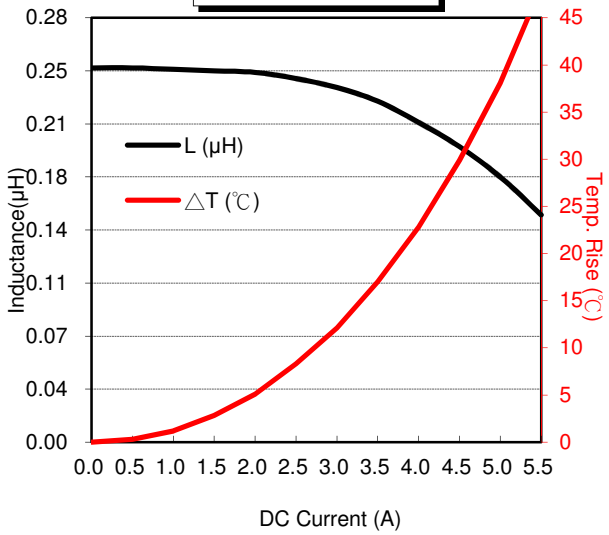


Peel speed：300mm/min

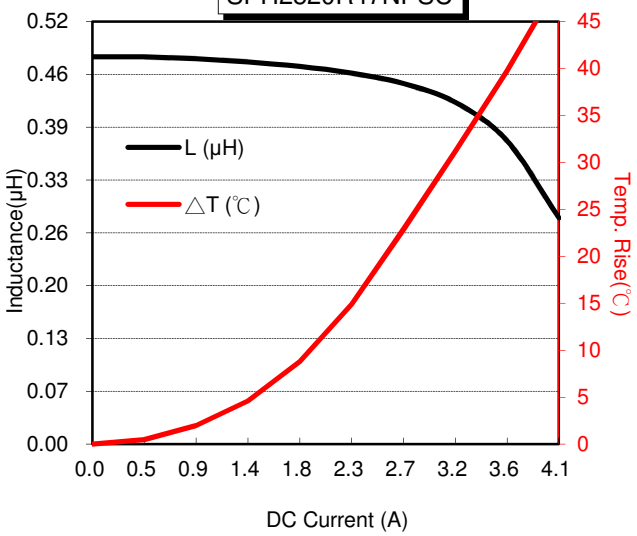
The peel force ： 0.1 to 1.3 N

8. Current characteristic

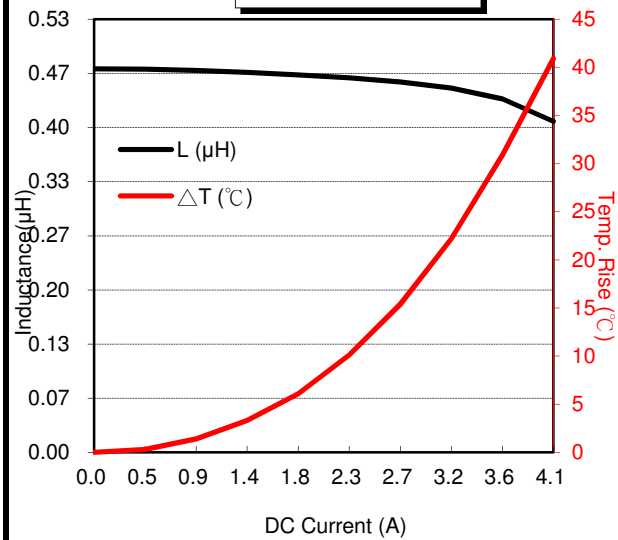
SPH2520R24NPSC



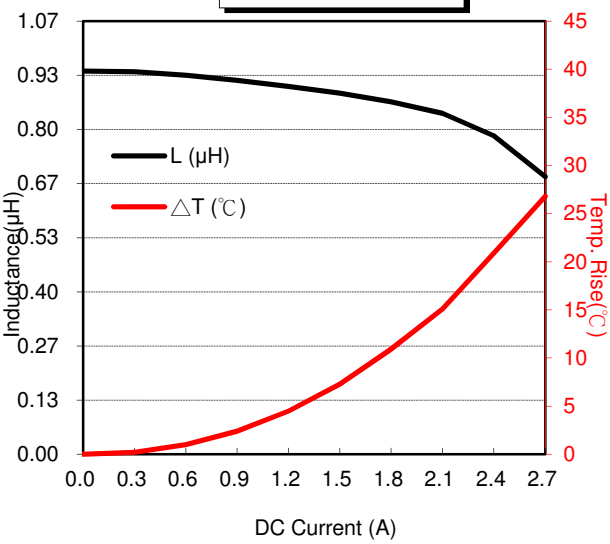
SPH2520R47NPSC



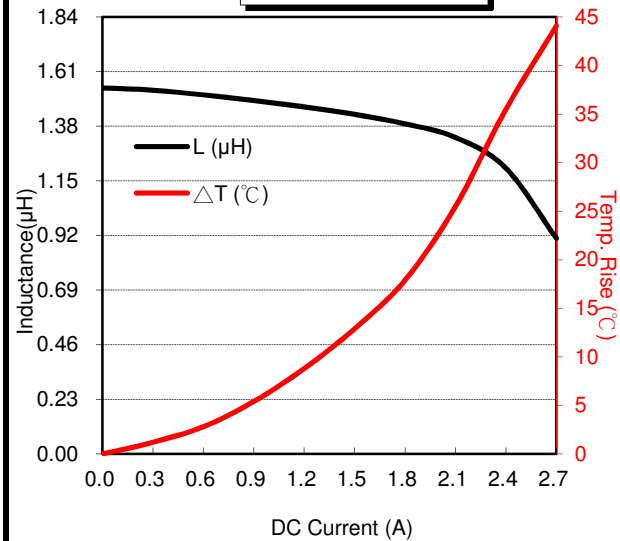
SPH2520R50NPSC



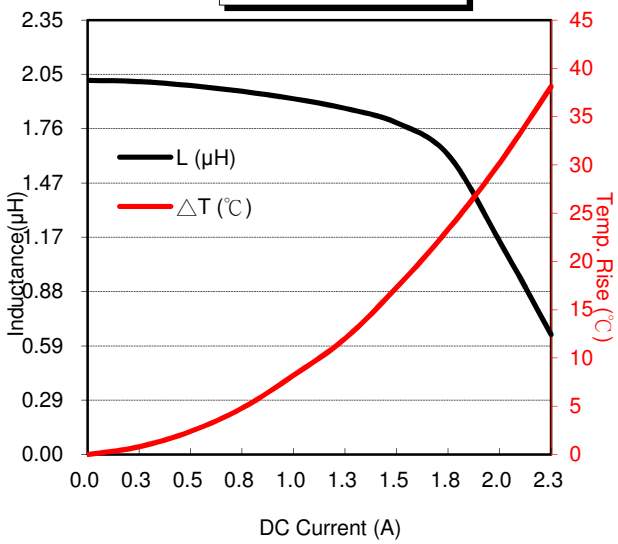
SPH25201R0NPSC



SPH25201R5MPSC



SPH25202R2MPSC



8. Current characteristic

