Version record (Darfon)

Ver.	Description of change	Owner	Release Date
0		Dora Chou	2017.05.12

Declaration of RoHS

有害物質不使用聲明：達方電子股份有限公司-線圈元件事業部 (Coils& Telecom Components B.D., Darfon Electronics Corp.) 在此保證所生產之電子元件(SPN /SPM / SPI/SPS)相符於歐盟『有毒物質禁用指令』(RoHS, 2011/65/EU)、 中國RoHs及REACH 1st至 16th版要求。

Ordering code(Example)

① ② ③ ④ ⑤ ⑥

SPH 7070 XXX X XX X

① Product Code

② Size (LxW, mm)

③ Inductance：

R22=0.22μH 2R2=2.2μH

④ Tolerance

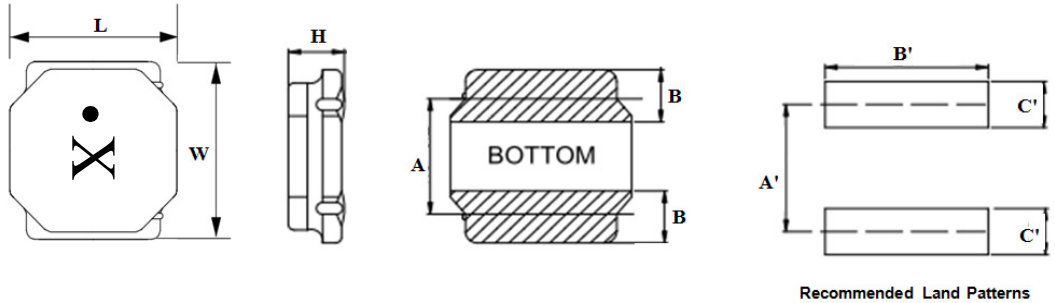
M=±20%, T=±25%, N=±30%

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	B	A'	B'	C'
Dimensions	4.0 ± 0.2	4.0 ± 0.2	1.2 Max	2.5 ± 0.2	1.1 ± 0.2	2.8	3.7	1.2

* Marking代碼請參照 "Electrical specification"。

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.	Max.	Max.	
SPH40401R0NETC	1.0	± 30%	42.0	50.0	2.20	2.80	A
SPH40402R2METC	2.2	± 20%	60.0	72.0	1.90	1.65	C
SPH40403R3METC	3.3	± 20%	70.0	84.0	1.70	1.40	E
SPH40404R7METC	4.7	± 20%	95.0	114.0	1.50	1.20	H
SPH40406R8METC	6.8	± 20%	125.0	150.0	1.30	0.90	I
SPH4040100METC	10.0	± 20%	170.0	204.0	1.10	0.80	K
SPH4040150METC	15.0	± 20%	260.0	312.0	0.75	0.65	M
SPH4040220METC	22.0	± 20%	400.0	480.0	0.62	0.50	N

■ NOTES

2-1. Test Frequency : 100 KHz , 1.0V

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

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

2-4. Idc(Irms) : DC current (A) that will cause an approximate △T of 20℃

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

2-6. 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.

2-7. Test Instrument : Inductance(CH-3302+CH-1320);Rdc(CH 16502)

※ Caution Temperature Rise

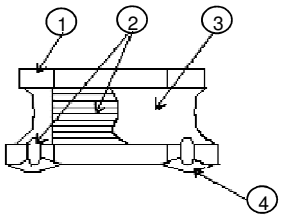
Temperature rise of this inductor depends on the installed board condition.

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

2-8. Weight=0.1 ± 0.03 g

3. Material list

Item	Description	Material	Safety No.	Manufactures
1	Core	Ni-Zn Ferrite DF-829		Darfon
2	Wire	Polyurethane copper wire 180℃	E143312	Elektrisola
3	Coating resin	Epoxy resin, containing ferrite powder DF-915		Darfon
4	Solder	Sn		Shenmao

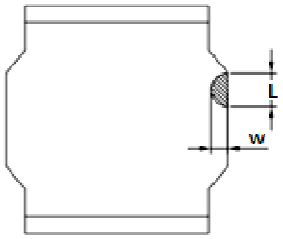


4. Appearance definition

4-1.Core chipping:

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

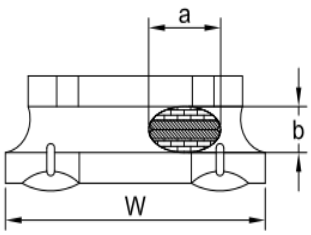
L	W
1.0mm Max	1.0mm Max



4-2 Void appearance tolerance limit

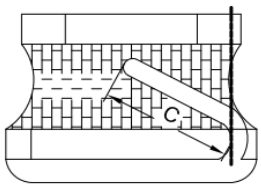
Size of voids occurring to coating resin is specified below.

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.

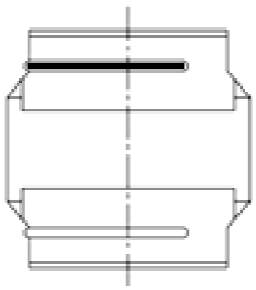


4-3 External appearance criterion for exposed wire

Exposed end of the winding wire at the secondary side should be 2mm and below.(i.e. c ≦ 2mm)



4-4 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

5. Precaution

5-1 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

5-2 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.

6. Reliability

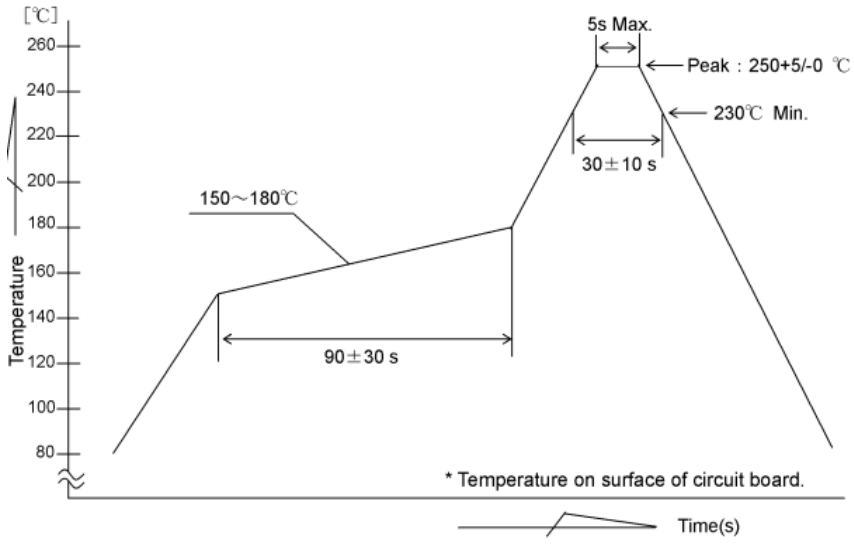
6-1. Mechanical

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

6-2. Endurance

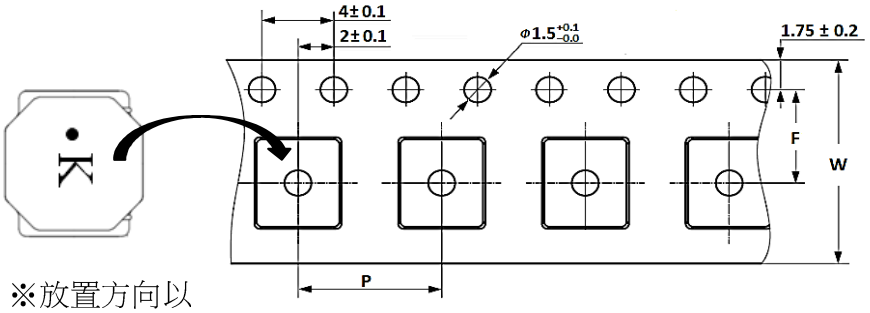
Item	Specification & Requirement	Test Method
Thermal Shock	1) No mechanical damage. 2) Inductance change within±10%.	(1) Repeat 100 cycles as follow : -40℃± 2℃, 30 ± 3 mins →Room temperature , 5 mins →+125℃± 2℃, 30 ± 3 mins →Room temperature , 5 mins (2) Recovery : 48 + 4 / - 0 hours of recovery under 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.		

7. Reflow profile chart (Reference)



8. PACKAGING :

8-1 Dimensions



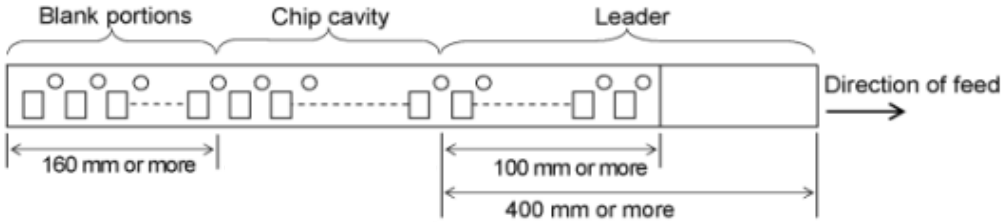
※放置方向以
K規格表示

Code	W	P	F
Dimensions	12.0 ± 0.2	8.0 ± 0.1	5.5 ± 0.1

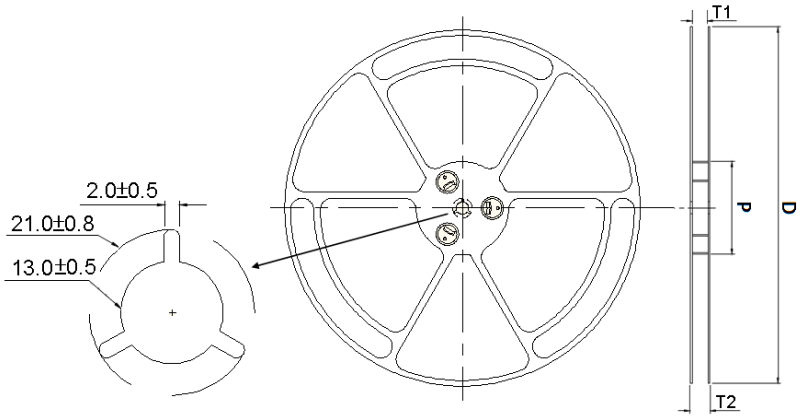
Unit：mm

※Tape採用熱封膠帶

8-2 Direction of rolling



8-3 Reel

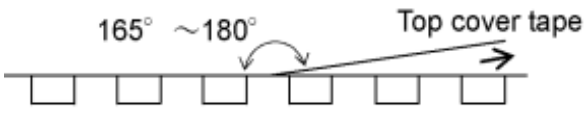


T1	T2
$8.4^{+0.2}_{-0.1}$	$12.4^{\pm 2.0}$
$12.4^{+0.2}_{-0.1}$	$17.0^{\pm 2.0}$
$16.4^{+0.2}_{-0.1}$	$21.0^{\pm 2.0}$
$24.4^{+0.2}_{-0.1}$	$28.4^{\pm 2.0}$

Code	D	P	Quantity(PCS)
Dimensions	330 ± 3.0	100 ± 1.5	4500

Unit：mm

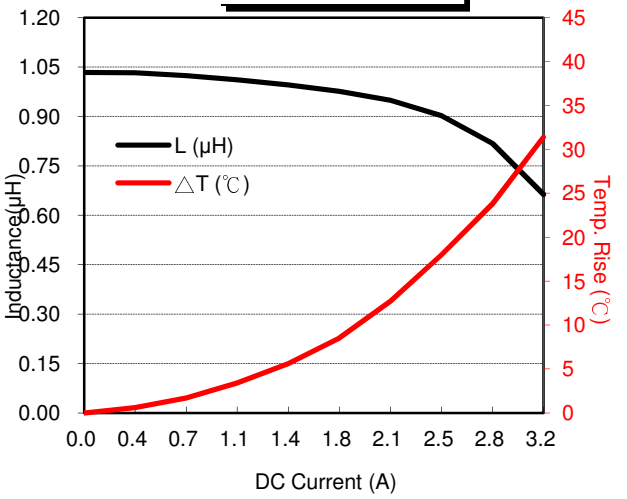
8-4 Peel force of top cover tape



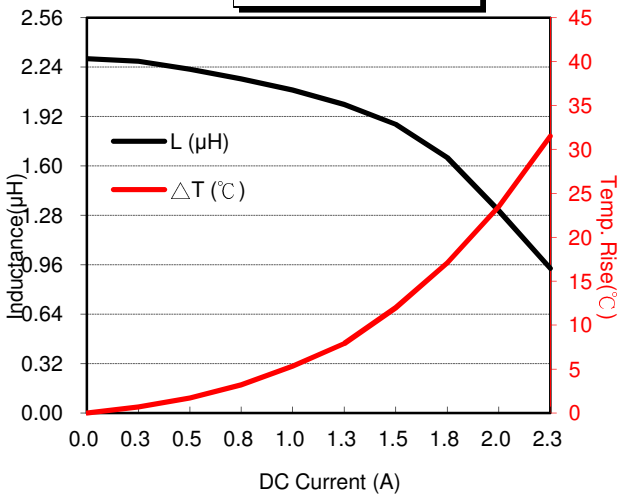
Peel speed：300mm/min
The peel force ： 0.1 to 1.3 N

9. DC BIAS CHARACTERISTICS

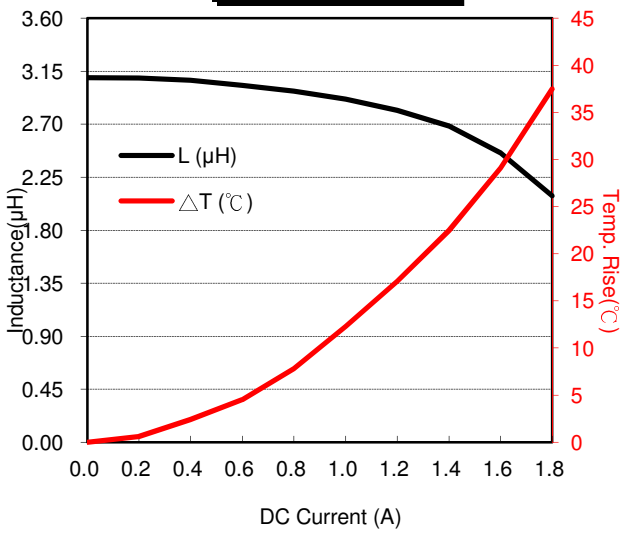
SPH40401R0NETC



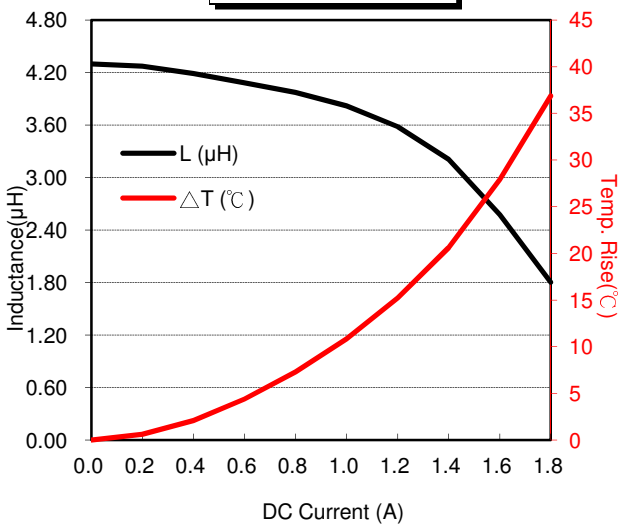
SPH40402R2METC



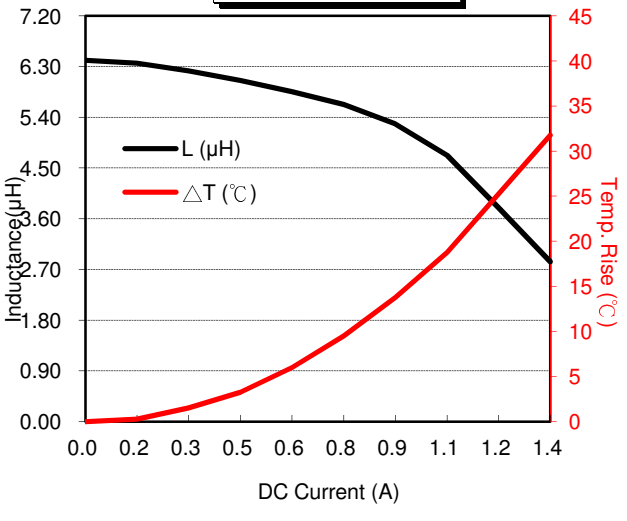
SPH40403R3METC



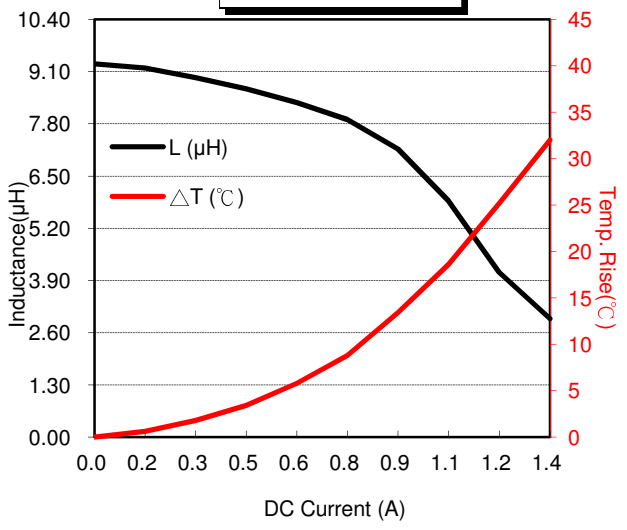
SPH40404R7METC



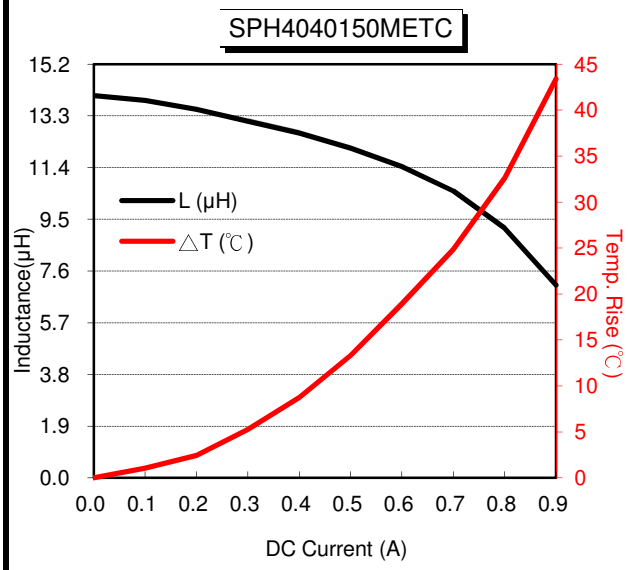
SPH40406R8METC

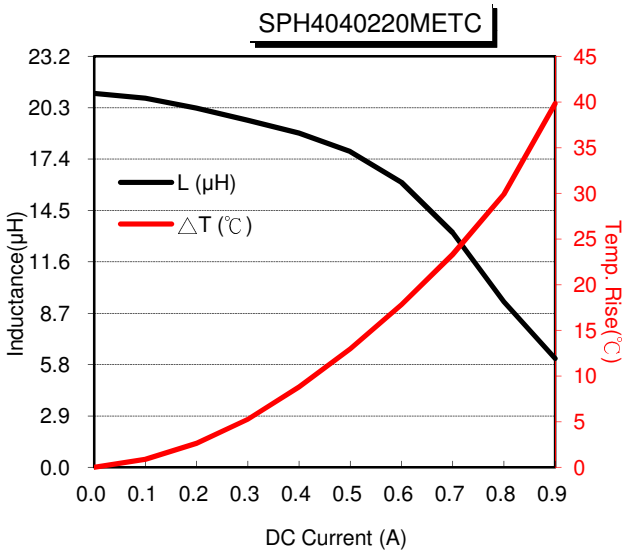


SPH4040100METC



9. DC BIAS CHARACTERISTICS





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