



SPECIFICATION FOR APPROVAL

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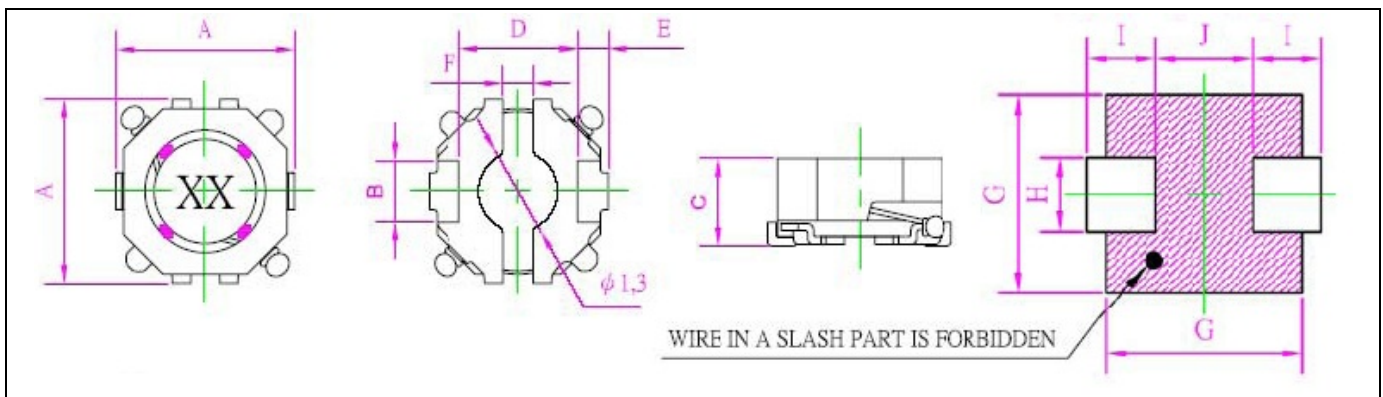
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PRODUCT DETAIL

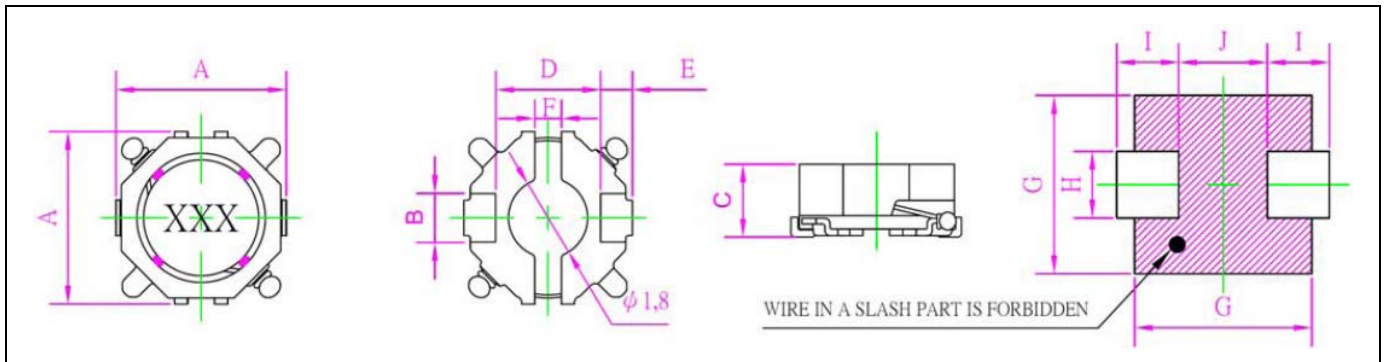
Electrical Characteristics			Test Instruments
L	Page 4~9	TEST FREQ: Page 4~9	<ul style="list-style-type: none"> •L : Agilent 4284A Precision LCR meter. •L Load : Agilent HP4284A WITH HP42841A Current source. •DCR : Milli-ohm meter. •Isat : The current when the inductance becomes 30% lower than its initial value. •Irms : The current when temperature of coil increases up to max $\Delta T=40^{\circ}\text{C}$. ($T_a=20^{\circ}\text{C}$)
DCR	Page 4~9	TEST LEVEL: Page 4~9	
Isat	Page 4~9	Operating Temp. $-40^{\circ}\text{C} \sim 105^{\circ}\text{C}$	
Irms	Page 4~9		

SHAPES AND DIMENSIONS :



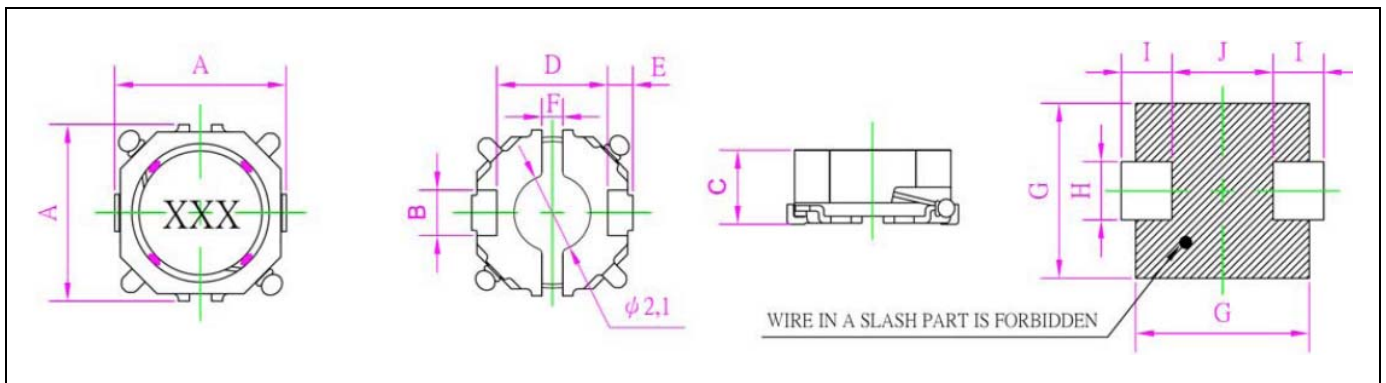
Series	Item /Spec.(mm)									
	A	B	C max	D	E	F	G	H	I	J
SBRI2D12	3.0±0.2	1.0	1.2	2.0	0.5	0.5	3.2	1.2	1.1	1.8
SBRI2D15	3.0±0.2	1.0	1.5	2.0	0.5	0.5	3.2	1.2	1.1	1.8
SBRI2D18	3.0±0.2	1.0	1.8	2.0	0.5	0.5	3.2	1.2	1.1	1.8

Marking : "XX"



Series	Item /Spec.(mm)									
	A	B	C (max)	D	E	F	G	H	I	J
SBRI3D12	3.8±0.2	1.1	1.2	2.4	0.7	0.6	4.0	1.5	1.4	2.0
SBRI3D15	3.8±0.2	1.1	1.5	2.4	0.7	0.6	4.0	1.5	1.4	2.0
SBRI3D18	3.8±0.2	1.1	1.8	2.4	0.7	0.6	4.0	1.5	1.4	2.0

Marking : "XXX"



Series	Item /Spec.(mm)									
	A	B	C max	D	E	F	G	H	I	J
SBRI4D12	4.6±0.3	1.3	1.2	3.2	0.7	0.6	5.0	1.6	1.4	2.8
SBRI4D15	4.6±0.3	1.3	1.5	3.2	0.7	0.6	5.0	1.6	1.4	2.8

Marking : "XXX"



PART NUMBER CODE

<u>SBRI</u>	<u>2D18</u>	<u>2R2</u>	<u>N</u>	<u>A</u>
1	2	3	4	5

1. Series Name
2. Size Code
3. Inductance (R=Decimal Point) Unit : μH
4. Inductance tolerance : "M" $\pm 20\%$; "N" $\pm 30\%$.
5. Soldering : A=Lead free



SHIELED SMT POWER INDUCTORS SBRI2D12 / 2D15 / 2D18 TYPE

Part NO.	Inductance (uH)	Test Freq. (0.1V)	DCR (mΩ) max	Isat (A) max		Irms (A) max
				20°C	100°C	
SBRI2D12-1R2NA	1.2	100KHz	117	0.85	0.70	1.05
SBRI2D12-2R2NA	2.2	100KHz	182	0.70	0.60	0.90
SBRI2D12-3R3NA	3.3	100KHz	260	0.60	0.50	0.82
SBRI2D12-4R7NA	4.7	100KHz	312	0.50	0.40	0.72
SBRI2D12-5R6NA	5.6	100KHz	442	0.46	0.35	0.67
SBRI2D12-6R8NA	6.8	100KHz	520	0.43	0.30	0.62
SBRI2D12-8R2NA	8.2	100KHz	560	0.38	0.28	0.58
SBRI2D12-100MA	10	100KHz	780	0.33	0.25	0.55

SBRI2D15-2R2NA	2.2	100KHz	150	1.00	0.80	1.00
SBRI2D15-3R3NA	3.3	100KHz	234	0.90	0.70	0.90
SBRI2D15-4R7NA	4.7	100KHz	338	0.80	0.60	0.85
SBRI2D15-5R6NA	5.6	100KHz	364	0.70	0.55	0.80
SBRI2D15-6R8NA	6.8	100KHz	416	0.60	0.52	0.77
SBRI2D15-8R2NA	8.2	100KHz	572	0.55	0.48	0.72
SBRI2D15-100MA	10	100KHz	624	0.50	0.45	0.70
SBRI2D15-120MA	12	100KHz	702	0.45	0.40	0.65
SBRI2D15-150MA	15	100KHz	949	0.40	0.35	0.50
SBRI2D15-180MA	18	100KHz	1090	0.35	0.30	0.40
SBRI2D15-220MA	22	100KHz	1250	0.30	0.25	0.30

SBRI2D18-2R2NA	2.2	100KHz	117	1.10	0.90	1.10
SBRI2D18-3R3NA	3.3	100KHz	143	1.00	0.80	1.00
SBRI2D18-4R7NA	4.7	100KHz	221	0.80	0.70	0.90
SBRI2D18-5R6NA	5.6	100KHz	247	0.75	0.60	0.85
SBRI2D18-6R8NA	6.8	100KHz	312	0.70	0.55	0.82
SBRI2D18-8R2NA	8.2	100KHz	351	0.60	0.50	0.78
SBRI2D18-100MA	10	100KHz	468	0.55	0.48	0.75
SBRI2D18-120MA	12	100KHz	533	0.50	0.45	0.65
SBRI2D18-150MA	15	100KHz	598	0.45	0.40	0.55
SBRI2D18-180MA	18	100KHz	715	0.40	0.33	0.50
SBRI2D18-220MA	22	100KHz	975	0.38	0.30	0.45
SBRI2D18-270MA	27	100KHz	1105	0.33	0.25	0.40
SBRI2D18-330MA	33	100KHz	1222	0.30	0.23	0.33
SBRI2D18-390MA	39	100KHz	1625	0.25	0.20	0.28
SBRI2D18-470MA	47	100KHz	1820	0.23	0.18	0.25



SHIELED SMT POWER INDUCTORS
SBRI3D12 TYPE

Part No.	Inductance L(uH)	Test Freq. (0.1V)	DCR (mΩ) max	Isat (A) max		Irms (A) max
				20°C	100°C	
SBRI3D12-1R2NA	1.2	100KHz	81	1.60	1.40	1.30
SBRI3D12-1R5NA	1.5	100KHz	100	1.40	1.20	1.10
SBRI3D12-2R2NA	2.2	100KHz	125	1.20	0.90	0.92
SBRI3D12-2R7NA	2.7	100KHz	188	1.10	0.85	0.87
SBRI3D12-3R9NA	3.9	100KHz	256	1.00	0.80	0.83
SBRI3D12-4R7NA	4.7	100KHz	287	0.90	0.70	0.80
SBRI3D12-5R6NA	5.6	100KHz	380	0.80	0.60	0.75
SBRI3D12-6R8NA	6.8	100KHz	450	0.70	0.55	0.65
SBRI3D12-8R2NA	8.2	100KHz	500	0.60	0.50	0.55
SBRI3D12-100MA	10	100KHz	650	0.50	0.35	0.45
SBRI3D12-120MA	12	100KHz	687	0.45	0.30	0.40
SBRI3D12-150MA	15	100KHz	787	0.40	0.27	0.37
SBRI3D12-180MA	18	100KHz	875	0.35	0.25	0.35
SBRI3D12-220MA	22	100KHz	962	0.30	0.20	0.30



**SHIELED SMT POWER INDUCTORS
SBRI3D15 TYPE**

Part No.	Inductance L(uH)	Test Freq. (0.1V)	DCR (mΩ) max	Isat (A) max		Irms (A) max
				20°C	100°C	
SBRI3D15-1R0NA	1.0	100KHz	78	2.00	1.80	1.80
SBRI3D15-1R5NA	1.5	100KHz	94	1.70	1.50	1.70
SBRI3D15-2R2NA	2.2	100KHz	106	1.40	1.20	1.60
SBRI3D15-2R7NA	2.7	100KHz	118	1.30	1.10	1.50
SBRI3D15-3R3NA	3.3	100KHz	131	1.10	1.00	1.40
SBRI3D15-3R9NA	3.9	100KHz	143	1.00	0.90	1.30
SBRI3D15-4R7NA	4.7	100KHz	162	0.95	0.85	1.20
SBRI3D15-5R6NA	5.6	100KHz	175	0.90	0.80	1.10
SBRI3D15-6R8NA	6.8	100KHz	212	0.85	0.75	1.00
SBRI3D15-8R2NA	8.2	100KHz	237	0.80	0.70	0.95
SBRI3D15-100MA	10.0	100KHz	262	0.70	0.50	0.90
SBRI3D15-120MA	12.0	100KHz	350	0.60	0.45	0.80
SBRI3D15-150MA	15.0	100KHz	456	0.55	0.42	0.75
SBRI3D15-180MA	18.0	100KHz	506	0.50	0.40	0.70
SBRI3D15-220MA	22.0	100KHz	575	0.45	0.37	0.55
SBRI3D15-270MA	27.0	100KHz	675	0.40	0.33	0.53
SBRI3D15-330MA	33.0	100KHz	937	0.35	0.30	0.50
SBRI3D15-390MA	39.0	100KHz	1037	0.32	0.28	0.45
SBRI3D15-470MA	47.0	100KHz	1262	0.28	0.22	0.43



SHIELED SMT POWER INDUCTORS
SBRI3D18 TYPE

Part No.	Inductance L(uH)	Test Freq. (0.1V)	DCR (mΩ) max	Isat (A) max		Irms (A) max
				20°C	100°C	
SBRI3D18-1R2NA	1.2	100KHz	88	2.00	1.80	1.90
SBRI3D18-1R8NA	1.8	100KHz	100	1.80	1.60	1.80
SBRI3D18-2R2NA	2.2	100KHz	113	1.60	1.40	1.70
SBRI3D18-2R7NA	2.7	100KHz	125	1.40	1.20	1.55
SBRI3D18-3R3NA	3.3	100KHz	138	1.20	1.10	1.45
SBRI3D18-3R9NA	3.9	100KHz	150	1.10	1.00	1.35
SBRI3D18-4R7NA	4.7	100KHz	162	1.00	0.90	1.25
SBRI3D18-5R6NA	5.6	100KHz	181	0.95	0.85	1.15
SBRI3D18-6R8NA	6.8	100KHz	200	0.90	0.80	1.05
SBRI3D18-8R2NA	8.2	100KHz	225	0.80	0.75	0.95
SBRI3D18-100MA	10.0	100KHz	250	0.75	0.70	0.85
SBRI3D18-120MA	12.0	100KHz	337	0.65	0.60	0.70
SBRI3D18-150MA	15.0	100KHz	393	0.60	0.55	0.65
SBRI3D18-180MA	18.0	100KHz	437	0.55	0.50	0.60
SBRI3D18-220MA	22.0	100KHz	563	0.50	0.45	0.55
SBRI3D18-270MA	27.0	100KHz	637	0.45	0.40	0.45
SBRI3D18-330MA	33.0	100KHz	712	0.40	0.35	0.40
SBRI3D18-390MA	39.0	100KHz	956	0.38	0.32	0.35
SBRI3D18-470MA	47.0	100KHz	1100	0.32	0.28	0.30



SHIELED SMT POWER INDUCTORS
SBRI4D12 TYPE

Part No.	Inductance L(uH)	Test Freq. (0.1V)	DCR (mΩ) max	Isat (A) max		Irms (A) max
				20°C	100°C	
SDRI4D12-1R0NA	1.0	100KHz	75	2.10	1.90	1.70
SDRI4D12-1R5NA	1.5	100KHz	89	1.80	1.60	1.60
SDRI4D12-2R2NA	2.2	100KHz	106	1.40	1.20	1.50
SDRI4D12-2R7NA	2.7	100KHz	125	1.30	1.10	1.40
SDRI4D12-3R3NA	3.3	100KHz	150	1.20	1.00	1.30
SDRI4D12-4R7NA	4.7	100KHz	196	1.10	0.95	1.20
SDRI4D12-5R6NA	5.6	100KHz	256	1.00	0.80	1.05
SDRI4D12-6R8NA	6.8	100KHz	312	0.90	0.75	1.00
SDRI4D12-8R2NA	8.2	100KHz	362	0.80	0.65	0.90
SDRI4D12-100MA	10.0	100KHz	450	0.70	0.60	0.80
SDRI4D12-120MA	12.0	100KHz	500	0.65	0.55	0.75
SDRI4D12-150MA	15.0	100KHz	700	0.60	0.50	0.70
SDRI4D12-180MA	18.0	100KHz	775	0.50	0.40	0.60
SDRI4D12-220MA	22.0	100KHz	1025	0.45	0.38	0.55
SDRI4D12-270MA	27.0	100KHz	1162	0.40	0.35	0.50
SDRI4D12-330MA	33.0	100KHz	1300	0.38	0.32	0.45
SDRI4D12-390MA	39.0	100KHz	1500	0.35	0.30	0.43
SDRI4D12-470MA	47.0	100KHz	1625	0.32	0.28	0.40



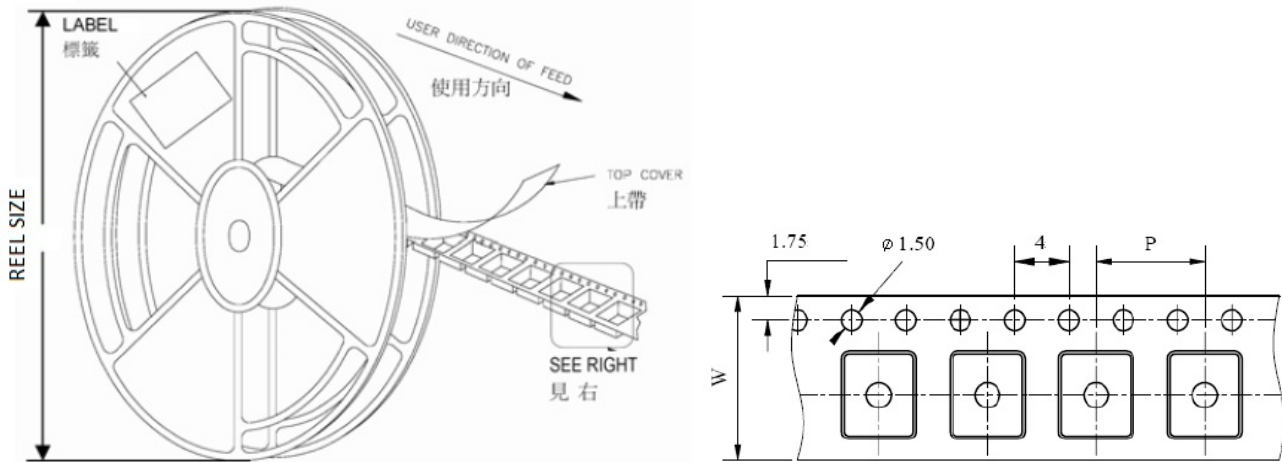
SHIELED SMT POWER INDUCTORS SBRI4D15 TYPE

Part No.	Inductance L(uH)	Test Freq. (0.1V)	DCR (mΩ) max	Isat (A) max		Irms (A) max
				20°C	100°C	
SBRI4D15-1R0NA	1.0	100KHz	81	3.00	2.60	1.75
SBRI4D15-1R2NA	1.2	100KHz	100	2.50	2.20	1.70
SBRI4D15-1R8NA	1.8	100KHz	121	2.20	1.80	1.65
SBRI4D15-2R7NA	2.7	100KHz	137	2.00	1.70	1.60
SBRI4D15-3R3NA	3.3	100KHz	150	1.80	1.60	1.55
SBRI4D15-3R9NA	3.9	100KHz	168	1.60	1.40	1.45
SBRI4D15-4R7NA	4.7	100KHz	187	1.50	1.20	1.35
SBRI4D15-5R6NA	5.6	100KHz	212	1.40	1.10	1.25
SBRI4D15-6R8NA	6.8	100KHz	230	1.30	1.05	1.15
SBRI4D15-8R2NA	8.2	100KHz	250	1.20	1.00	1.05
SBRI4D15-100MA	10.0	100KHz	312	1.00	0.85	0.95
SBRI4D15-120MA	12.0	100KHz	356	0.85	0.80	0.85
SBRI4D15-150MA	15.0	100KHz	475	0.80	0.70	0.80
SBRI4D15-180MA	18.0	100KHz	618	0.75	0.65	0.70
SBRI4D15-220MA	22.0	100KHz	692	0.65	0.58	0.65
SBRI4D15-270MA	27.0	100KHz	980	0.60	0.50	0.55
SBRI4D15-330MA	33.0	100KHz	1068	0.55	0.45	0.50
SBRI4D15-390MA	39.0	100KHz	1200	0.50	0.40	0.45
SBRI4D15-470MA	47.0	100KHz	1710	0.45	0.38	0.42



REEL DIMENSIONS

Unit : mm



REEL PACKAGING QUANTITY

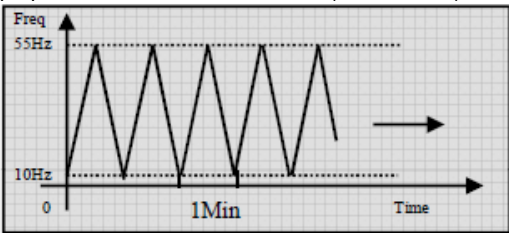
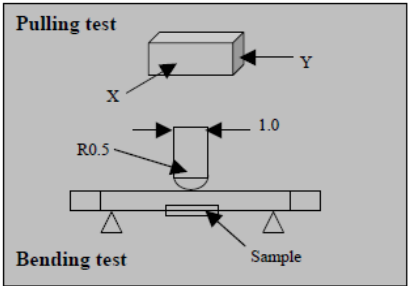
TYPE	W	P	REEL SIZE	PCS / REEL
SBRI2D12	12	8	330 mm (13")	4000
SBRI2D15	12	8	330 mm (13")	4000
SBRI2D18	12	8	330 mm (13")	3500
SBRI3D12	12	8	330 mm (13")	4000
SBRI3D15	12	8	330 mm (13")	4000
SBRI3D18	12	8	330 mm (13")	3500
SBRI4D12	12	8	330 mm (13")	4000
SBRI4D15	12	8	330 mm (13")	4000

RELIABILITY AND TEST CONDITION

Environmental tests conditions (SMD wire wound Inductor)

Item (項目)	Required Characteristics (要求)	Test Method/Condition (測試方法)
<p>High temperature Storage test</p> <p>Reference documents: MIL-STD-202G Method 108A</p> <p>高溫儲存試驗</p>	<p>1.No case deformation or change in appearance. 2.$\Delta L/L \leq 10\%$ or 15% 3.$\Delta DCR/DCR \leq 10\%$</p> <p>N : The High temperature, depend on the spec. N : 高溫設定，依據產品規格設定</p> <p>1.無明顯的外觀缺陷 2.感值變化不超過 10% 或者 15% 3.直流電阻變化不超過 10%</p>	<p>Temperature: $N \pm 2^\circ\text{C}$ Time : 96 ± 2 hours Tested not less than 1 hour, nor more than 2 hours at room temperature.</p> <p>溫度: $N \pm 2^\circ\text{C}$, 時間: 96 ± 2 小時 樣品在室溫下放置 1 小時, 不超過 2 小時必須測試.</p>
<p>Low temperature Storage test</p> <p>Reference documents: IEC 68-2-1A 6.1 6.2</p> <p>低溫儲存試驗</p>	<p>1.No case deformation or change in appearance. 2.$\Delta L/L \leq 10\%$ or 15% 3.$\Delta DCR/DCR \leq 10\%$</p> <p>M : The Low temperature, depend on the spec. M : 低溫設定，依據產品規格設定</p> <p>1.無明顯的外觀缺陷 2.感值變化不超過 10% 或者 15% 3.直流電阻變化不超過 10%</p>	<p>Temperature: $M \pm 2^\circ\text{C}$ Time : 96 ± 2 hours Tested not less than 1 hour, nor more than 2 hours at room temperature.</p> <p>溫度: $M \pm 2^\circ\text{C}$, 時間: 96 ± 2 小時 樣品在室溫下放置 1 小時, 不超過 2 小時必須測試.</p>
<p>Humidity test Reference</p> <p>documents: MIL-STD-202G Method 103B</p> <p>濕度測試</p>	<p>1.No case deformation or change in appearance. 2.$\Delta L/L \leq 10\%$ or 15% 3.$\Delta DCR/DCR \leq 10\%$</p> <p>1.無明顯的外觀缺陷 2.感值變化不超過 10% 或者 15% 3.直流電阻變化不超過 10%</p>	<p>Temperature: $40 \pm 2^\circ\text{C}$, Humidity: $93 \pm 3\% \text{RH}$ Time : 96 ± 2 hours Tested not less than 1 hour, nor more than 2 hours at room temperature.</p> <p>溫度: $40 \pm 2^\circ\text{C}$, 濕度: $93 \pm 3\% \text{RH}$ 時間 : 96 ± 2 hours 樣品在室溫下放置 1 小時, 不超過 2 小時必須測試.</p>
<p>Thermal shock test</p> <p>Reference documents: MIL-STD-202G Method 107G</p> <p>熱衝擊測試</p>	<p>1.No case deformation or change in appearance. 2.$\Delta L/L \leq 10\%$ or 15% 3.$\Delta DCR/DCR \leq 10\%$</p> <p>N : The High temperature, depend on the spec. M : The Low temperature, depend on the spec.</p> <p>For T: weight $\leq 28\text{g}$: 15Min; $28\text{g} \leq \text{weight} \leq 136\text{g}$: 30Min</p> <p>1.無明顯的外觀缺陷 2.感值變化小於 10% 或者 15% 3.直流電阻變化小於 10%</p>	<p>First $M^\circ\text{C}$ for T time, next $N^\circ\text{C}$ for T time as 1 cycle. Go through 20 cycles.</p> <p>從 $M^\circ\text{C}$ 作用 T 分鐘, 然後溫度衝擊到 $N^\circ\text{C}$ 作用 T 分鐘, 作為一個循環, 共作用 20 次.</p>

Physical characteristic tests conditions (SMD wire wound Inductor)

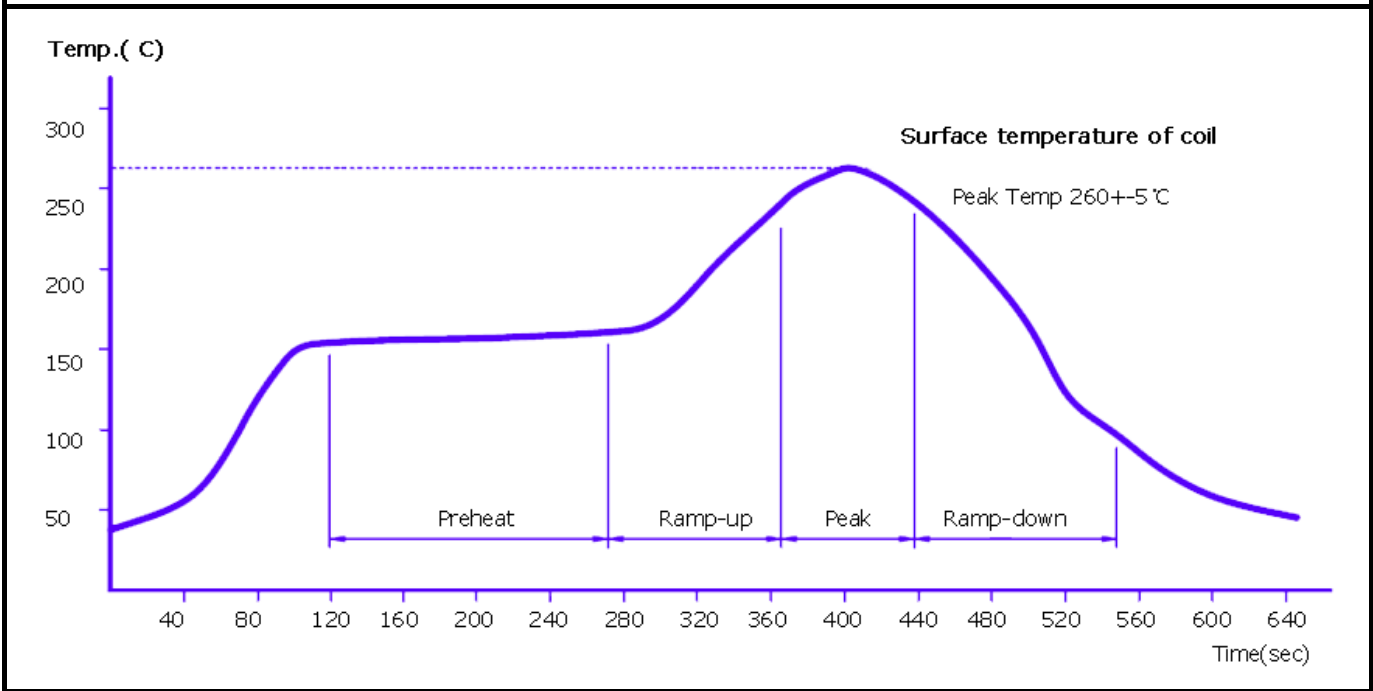
Item (項目)	Required Characteristics (要求)	Test Method/Condition (測試方法)
Solderability test Reference documents: MIL-STD-202G Method 208H IPC J-STD-002B 可焊性測試	Terminals area must have 95% min. Solder coverage 端子必須有 95%以上著錫	<ul style="list-style-type: none"> ● Dip pads in flux then dip in solder pot at 245±5°C for 5 second. ● Solder: lead free ● Flux: rosin flux ● 端子侵入著焊劑，然後侵入 245±5°C 錫爐中 5 秒 ● 焊料：無鉛焊料 ● 助焊劑：松香助焊劑
Heat endurance of Reflow soldering Reference documents: IPC J-STD-020D 過再流焊測試	<ul style="list-style-type: none"> ● No case deformation or change in appearance. ● $\Delta L/L \leq 10\%$ or 15% ● $\Delta DCR/DCR \leq 10\%$ ● 無明顯的外觀缺陷 ● 感值變化不超過 10% 或者 15% ● 直流電阻變化不超過 10% 	<ul style="list-style-type: none"> ● Refer to the next page reflow curve Go through 3 times ● The peak temperature : 260+/-5°C ● 參照下頁回流焊曲線過三次 ● 峰值溫度為: 260+/-5°C
Vibration test Reference documents: MIL-STD-202G Method 201A 振動測試	1.No case deformation or change in appearance. 2.No short and no open. 1.無明顯的外觀缺陷 2.無短路開路異常	Apply frequency 10~55Hz. 1.5mm amplitude in each of perpendicular direction for 2 hours.(total 6 hours)  用 10~55Hz 振動頻率 1.5mm 振幅沿 X,Y,Z 方向各振動 2 小時.(共 6 小時)
Drop test Reference documents: MIL-STD-202G Method 203C 落下試驗	1.No case deformation or change in appearance. 2.No short and no open. 1.無明顯的外觀缺陷 2.無短路開路異常	Packaged & Drop down from 1m with 981m/s ² (100G) attitude In 1 angle 1 ridges & 2 surfaces orientations. 將產品包裝後從 1 米高度自然落下至試驗板上 1 角 1 稜 2 面
Terminal strength push test Reference documents: JIS C 5321:1997 端子強度試驗	Pulling test: DEFINE: A: sectional area of terminal 0.5mm ² <A≤1.2mm ² ; force >2kgf ; time : 10sec 1.2mm ² <A ; force >4kgf ; time: 10sec Bending test: Soldering the products on PCB, after the pulling test and bending test ,terminal should not pull off 推力測試 定義: A: 焊接端子截面積 0.5mm ² <A≤1.2mm ² ; 推力 >2kgf ; 時間: 10sec 1.2mm ² <A ; 推力 >4kgf ; 時間: 10sec 彎折測試: 將產品焊於PCB上,分別經過推力測試和彎折測試後,端子不會發生松脫	Bend the testing PCB at middle point, the deflection shall be 2mm  將 PCB 對中彎折,到達撓度 2mm
Resistance to solvent test Reference documents: IEC 68-2-45:1993 耐溶劑性試驗	No case deformation or change in appearance, or obliteration of marking 無外觀破壞及標記破損	To dip parts into IPA solvent for 5±0.5Min, then drying them at room temp for 5Min,at last ,to brushing making 10 times. 在 IPA 溶劑中浸泡 5±0.5 分鐘,室溫下乾燥 5 分鐘,然後擦拭 10 次。



RELIABILITY TEST CONDITIONS WIRE WOUND CHIP INDUCTORS TYPE

Item (項目)	Required Characteristics(要求)	Test Method / Condition (測試方法)
Electronic characteristic test of major products 主要產品電特性測試	Refer to catalogue of specific products 參照具體產品目錄頁	Refer to catalogue of specific products 參照具體產品目錄頁書
Overload test Reference documents: JIS C5311-6.13 過負荷試驗	<ul style="list-style-type: none"> ● During the test no smoke, no peculiar, smell, no fire ● The characteristic is normal after test ● 試驗過程中無冒煙,異味,著火等, ● 試驗後產品特性正常 	Apply twice as rated current for 5 minutes. (It's not application to some special design) 通兩倍額定電流 5 分鐘 (部分特殊設計產品不適用)

Curve of Heat endurance of Reflow soldering test



1. This peak temperature only applicable to some special parts. The operating parameter may very according to the part type.
2. A test is made under the conditions mentioned above. And it is left 1 hour in the normal temperature and humidity. After that, no mechanical and electrical defeat should be found out.
3. The reflow condition is according to the machine used by our company.

NOTE : Above specifications are only for reference, follow confirmation documents for the specific test conditions.