

Customer: LC0001

LOT NO:

[New Released, Revised]

SPECIFICATIONS

Product

Name: SMD Power Inductors

SXN _____

Part Number: SM4532-221MT

Customer _____

Part Number: SM4532-221MT

【For Customer approval Only】

Date: _____

| Approved By | Verified By | Re-checked By | Checked By |
|-------------|-------------|---------------|------------|
| | | | |

SHENZHEN SHUNXIANGNUO ELECTRONICS CO.,LTD.

| Approved By | Checked By | Issued By |
|-------------|------------|-----------|
| 张磊平 | 汪秀华 | 张玲琴 |



SHENZHEN SHUNXIANGNUO ELECTRONICS CO.,LTD.

Tel:0755-23760960 Fax:0755-28484866

SPECIFICATION FOR APPROVAL

| | |
|------------------|--------------|
| CUSTOMER: LC0001 | PAGE: 2 OF 8 |
|------------------|--------------|

| | |
|-----------------------|----------|
| SXN P/N: SM4532-221MT | LOT NO : |
|-----------------------|----------|

| 1.MECHANICAL DIMENSIONS DRAW NO:SM4532 | Item | Spec(mm) | Ref. |
|--|----------|----------|------------|
| <p>MARKING (印字)</p> <p>SCHEMATIC 原理圖</p> <p>PAD LAYOUT</p> <p>EACH TAPE : 2000 PCS</p> | A | 4.5±0.3 | |
| | B | 4.0±0.3 | |
| | C | 3.2±0.3 | |
| | D | | |
| | E | | |
| | F | | |
| | G | | |
| | H | | |
| | I | | |
| | Marking: | | 黑色字体 “221” |

2.ELECTRICAL CHARACTERISTICS:

| Item | Spec | Ref. | Test Equipments |
|-----------|----------------------------|---------|-----------------|
| L | 220uH ±10% | 217.2uH | VR1153 LCR+DCR |
| Test Freq | 1KHZ@0.25V | | |
| L load | L+0.18A:L DROP 10%Max | 205.1uH | VR1153 & VR7210 |
| Test Freq | 1KHZ@0.25V | | |
| DCR | 2.35oHM Max | 1.98Ω | VR1153 LCR+DCR |
| Turn | 99.5T (REF) | | |
| Ope.Temp | -20 TO 80°C | | |

| | | | |
|-------------------|----------|---------|-------|
| CUSTOMER APPROVED | APPROVED | CHECKED | DRAWN |
| | 张磊平 | 汪秀华 | 张玲琴 |

ISSUE DATE: 28/Mar/18 PRINT DATE: 28/Mar/18 REV:1.0

FRM-ZFENG-007

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SPECIFICATION FOR APPROVAL

CUSTOMER: LC0001 PAGE: 3 OF 8

SXN P/N: SM4532-221MT LOT NO : 0

3.MAIN MATERIALS & SUPPLIERS:

| Item | Suppter | SGS No |
|-----------------------|------------------------------------|--------|
| 1-CD4.5*3.2*1.8-UN | UNITED ELECTRONICS CO.,LTD | |
| 2-2UEWH-0.10mm (P180) | ELEKTRISOLSA(MALAYSIA)SDN.BHD | |
| 3-SOLDERWIRE-SnCu | SHEN ZHEN QIAN TIAN SOLDER CO.,LTD | |

4.PACKAGING MATERIALS & SUPPLIERS:

| | | |
|------------------|-----------------------------------|--|
| 5-REEL-13"xW12MM | CHI SHING(H.K) INDUSTRIAL CO.,LTD | |
| 5-CARRIER-SM4532 | CHI SHING(H.K) INDUSTRIAL CO.,LTD | |
| 5-COVER-9.3MM | CHI SHING(H.K) INDUSTRIAL CO.,LTD | |

| 5.NOTES: | APPROVED | CHECKED | DRAWN |
|----------|----------|---------|-------|
| | 张磊平 | 汪秀华 | 张玲琴 |

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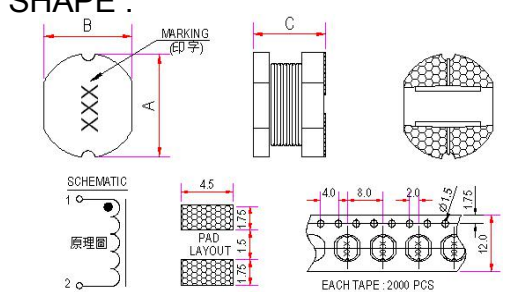
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SPECIFICATION FOR APPROVAL

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| CUSTOMER : LC0001 | PAGE: 4 OF 8 |
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| LC P / N : SM4532-221MT | DATE : 28/Mar/18 |
|-------------------------|------------------|

| | |
|--|--|
| LOT NO : | SHAPE :  |
| QUANTITY : 10 | |
| TEST FREQ.: L@1KHz/0.25V | |
| COIL DESCRIPTION : | |
| WIRE : 0.1 mm TURN : 99.5 Ts | |
| TEMP: 23 °C HUMI: 37 % | |

ELECTRICAL CHARACTERISTICS AND MECHANICAL DIMENSIONS (m/m) :

| ITEM | L | L +0.18A | DCR | A | B | C | D | E | F | G | H |
|-----------|--------|----------|-------|------|------|------|---|---|---|---|---|
| SPEC | 220uH | 220uH | 2.350 | 4.5 | 4.0 | 3.2 | | | | | |
| TOL. | ±10% | ±10% | Ω | ±0.3 | ±0.3 | ±0.3 | | | | | |
| 1 | 217.20 | 209.20 | 2.00 | 4.47 | 4.08 | 3.18 | | | | | |
| 2 | 220.70 | 212.30 | 2.01 | 4.47 | 4.05 | 3.18 | | | | | |
| 3 | 219.80 | 205.10 | 2.03 | 4.47 | 4.07 | 3.17 | | | | | |
| 4 | 218.70 | 209.50 | 1.98 | 4.46 | 4.10 | 3.18 | | | | | |
| 5 | 223.50 | 215.30 | 2.10 | 4.49 | 4.09 | 3.20 | | | | | |
| 6 | 218.60 | 210.60 | 2.06 | 4.47 | 4.08 | 3.19 | | | | | |
| 7 | 219.20 | 215.30 | 2.08 | 4.47 | 4.07 | 3.18 | | | | | |
| 8 | 220.60 | 208.70 | 2.10 | 4.48 | 4.08 | 3.19 | | | | | |
| 9 | 223.40 | 216.30 | 2.06 | 4.46 | 4.10 | 3.17 | | | | | |
| 10 | 220.80 | 211.30 | 1.98 | 4.48 | 4.09 | 3.20 | | | | | |
| Max | 223.50 | 216.30 | 2.10 | 4.49 | 4.10 | 3.20 | | | | | |
| Min | 217.20 | 205.10 | 1.98 | 4.46 | 4.05 | 3.17 | | | | | |
| \bar{X} | 220.25 | 211.36 | 2.04 | 4.47 | 4.08 | 3.18 | | | | | |
| JUDGE | OK | OK | OK | OK | OK | OK | | | | | |

| | | |
|--|----------|-----------|
| | APPROVED | INSPECTED |
| | 汪秀华 | 张玲琴 |

FRM-ENG-007

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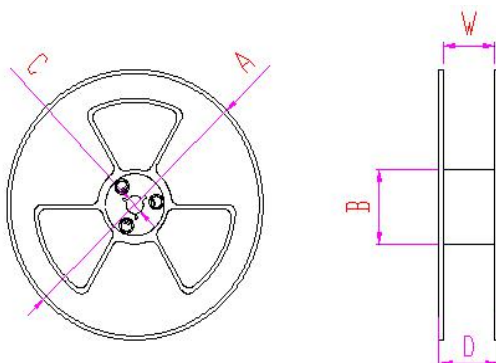
PACKAGING

CUSTOMER : LC0001

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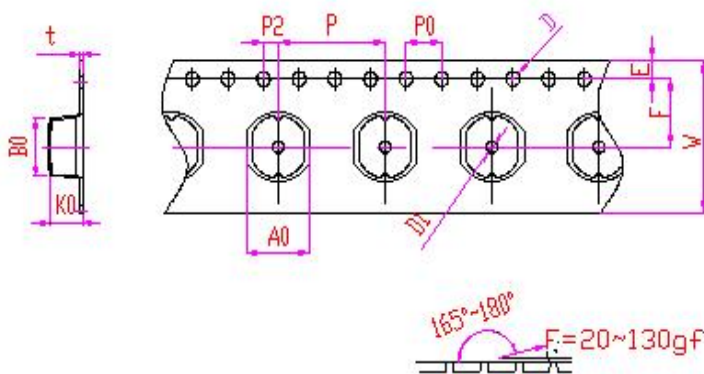
DATE : 28/Mar/18

1. 每卷轴包装数量:2000PCS/R (开始与结尾留空30~40cm不装COIL), 贴上正确的标签,卷轴及载带尺寸.如图(一)



卷轮尺寸 (REEL DIMENSIONS) 一般公差±0.5mm

| A | B | C | W | D |
|------|------|-------|------|------|
| Φ330 | Φ100 | Φ13.5 | 12.5 | 18.5 |

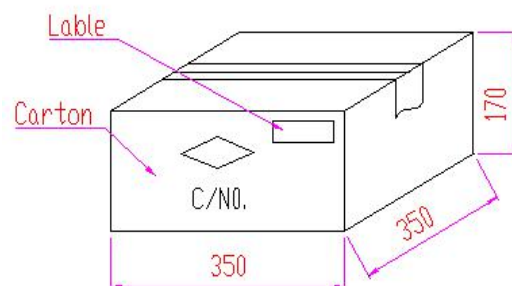


载带尺寸(TAPE DIMENSIONS):

| W | A0 | B0 | K0 | P | F | E | D | D1 | P0 | P2 | t |
|--------|---------|---------|---------|-------|---------|----------|---------|---------|-------|-------|-----------|
| 12±0.3 | 4.4±0.1 | 4.9±0.1 | 3.6±0.1 | 8±0.1 | 5.5±0.1 | 1.75±0.1 | 1.5±0.1 | 1.5±0.1 | 4±0.1 | 2±0.1 | 0.35±0.05 |

2. 每啤盒包装数量可依照客户要求。

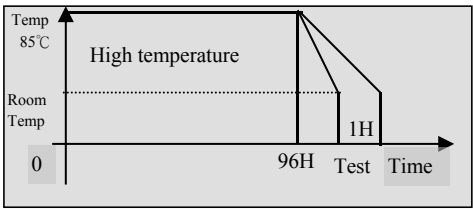
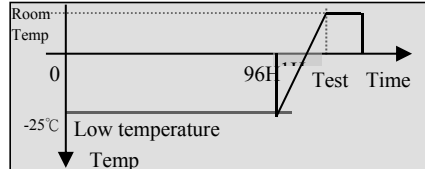
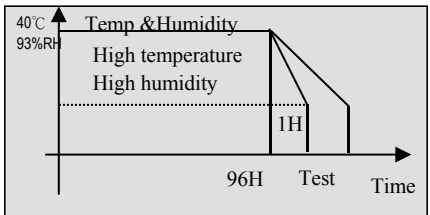
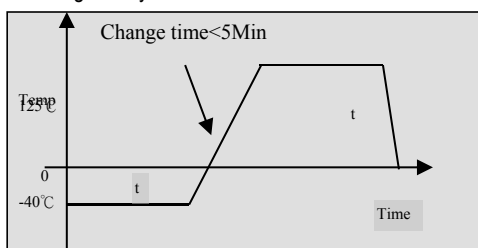
3. 每箱包装数量可依照客户要求。



FRM-ENGRD-007

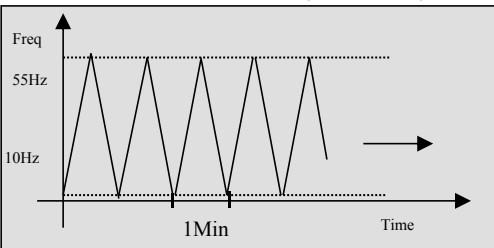
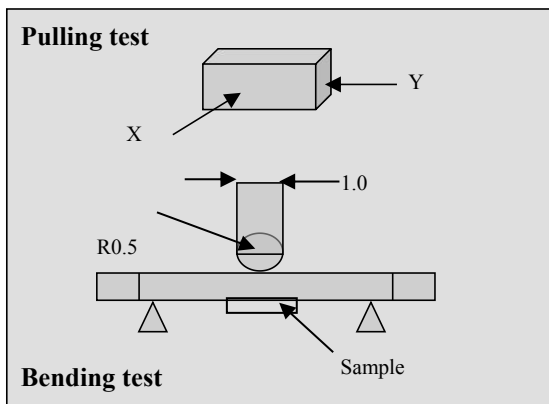
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RELIABILITY TEST CONDITIONS

| Item (項目) | Required Characteristics (要求) | Test Method / Condition (測試方法) |
|---|--|--|
| High temperature Storage test Reference documents: MIL-STD-202G Method 108A 高溫儲存試驗 | 1.No case deformation or change in appearance. 2. $\Delta L/L \leq 10\%$ 1.無明顯的外觀缺陷 2.感值變化不超過10% | Temperature: $85 \pm 2^\circ\text{C}$ Time : 96 ± 2 hours Tested not less than 1 hour, nor more than 2 hours at room tempe  溫度: $85 \pm 2^\circ\text{C}$ 時間: 96 ± 2 小時 樣品在室溫下放置1小時,不超2小時間必須測試. |
| Low temperature Storage test Reference documents: IEC 68-2-1A 6.1 6.2 低溫儲存試驗 | 1.No case deformation or change in appearance. 2. $\Delta L/L \leq 10\%$ 1.無明顯的外觀缺陷 2.感值變化不超過10% 3.品質因數變化不超過30% | Temperature: $-25 \pm 2^\circ\text{C}$ Time : 96 ± 2 hours Tested not less than 1 hour, nor more than 2 hours at room temperature.  溫度: $-25 \pm 2^\circ\text{C}$ 時間: 96 ± 2 小時 樣品在室溫下放置1小時,不超2小時間必須測試. |
| Humidity test Reference documents: MIL-STD-202G Method 103B 濕度測試 | 1.No case deformation or change in appearance. 2. $\Delta L/L \leq 10\%$ 3. $\Delta Q/Q \leq 30\%$ 1.無明顯的外觀缺陷 2.感值變化不超過10% 3.品質因數變化不超過30% | 1. Dry oven at a temperature of $40^\circ \pm 5^\circ\text{C}$ for 24 hours. 2. Measurements At the end of this period 3. Exposure: Temperature: $40 \pm 2^\circ\text{C}$  1.樣品必須先在 $40^\circ \pm 5^\circ$ 條件下乾燥24小時 2.乾燥後測試 3.暴露: 溫度: $40 \pm 2^\circ\text{C}$, 溼度: $93 \pm 3\% \text{RH}$ |
| Thermal shock test Reference documents: MIL-STD-202G Method 107G 熱衝擊測試 | 1.No case deformation or change in appearance. 2. $\Delta L/L \leq 10\%$ 3. $\Delta Q/Q \leq 30\%$ For T: weight $\leq 28\text{g}$: 15Min; $28\text{g} \leq \text{weight} \leq 136\text{g}$: 30Min 1.無明顯的外觀缺陷 2.感值變化小於10% 3.品質因數變化小於30% | First -40°C for T time, last 125°C T time as 1 cycle. Go through 20 cycles.  從 -40°C 作用T分鐘,然後溫度衝擊到 125°C 作用T分鐘,作為一個循環,共作用20次. |

Environmental tests (環境試驗)

RELIABILITY TEST CONDITIONS

| 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 | 1. Dip pads in flux then dip in solder pot at 245±5°C for 5 seconds. 2. Solder: Sn(63)/Pb(37) 3. Flux: ros 1. 端子浸入助焊劑, 然後浸入245±5°C 錫爐中5秒 2. 焊料: Sn(63)/Pb(37) 3. 助焊劑: 松香助焊劑 |
| Heat endurance of Reflow soldering Reference documents: IPC J-STD-020B 過再流焊測試 | 1. No case deformation or change in appearance. 2. $\Delta L/L \leq 10\%$ 3. $\Delta Q/Q \leq 30\%$ 4. $\Delta DCR/DCR \leq 10\%$ 1. 無明顯的外觀缺陷 2. 感值變化不超過10% 3. 品質因數變化不超過30% | 1. Refer to the next page reflow curve Go through 3 times 2. The peak temperature : 245±5°C 1. 參照下頁回流焊曲線過三次 2. 峰值溫度為: 245±5°C |
| Vibration test Reference documents: MIL-STD-202G Method 201A 振動測試 | 1. No case deformation or change in appearance. 2. $\Delta L/L \leq 10\%$ 3. $\Delta Q/Q \leq 30\%$ 4. $\Delta DCR/DCR \leq 10\%$ 1. 無明顯的外觀缺陷 2. 感值變化不超過10% 3. 品質因數變化不超過30% | Apply frequency 10~55Hz. 0.75mm amplitude in each of perpendicular direction for 2 hours. (total 6 hours)  用10~55Hz 振動頻率0.75mm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. $\Delta L/L \leq 10\%$ 3. $\Delta Q/Q \leq 30\%$ 4. $\Delta DCR/DCR \leq 10\%$ 1. 無明顯的外觀缺陷 2. 感值變化不超過10% 3. 品質因數變化不超過30% | 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 $A \geq 8\text{mm}^2$ force $\geq 5\text{N}$ time: 30sec 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 $A \geq 8\text{mm}^2$ 推力 ≥ 5 牛頓 時間: 30秒 $8\text{mm}^2 < A \leq 20\text{mm}^2$ 推力 ≥ 10 牛頓 時間: 10秒 | 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. |

Physical characteristic tests (物理特性試驗)

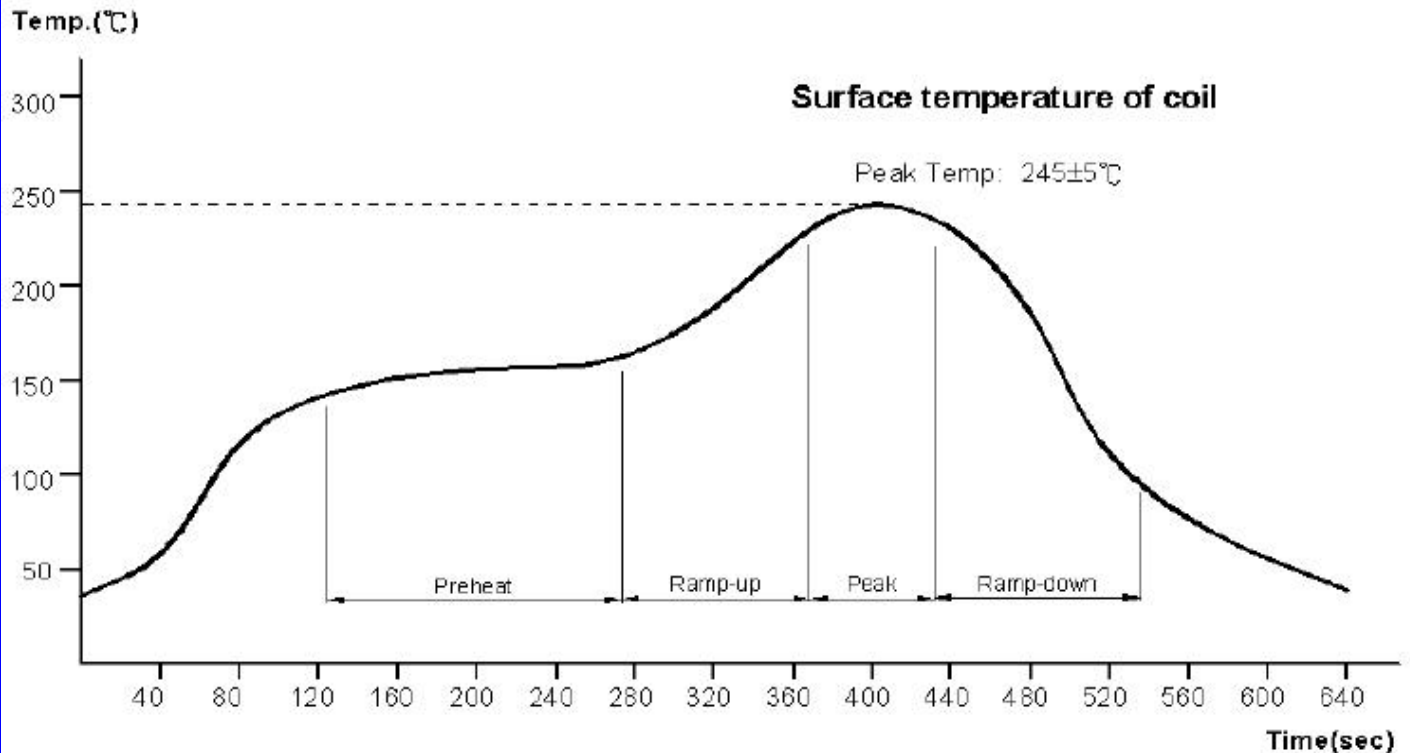
RELIABILITY TEST CONDITIONS

FOR SMT/SMD PRODUCTS

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| 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 | 1. During the test no smoke, no peculiar, smell, no fire 2. The characteristic is normal after test 1. 試驗過程中無冒煙, 異味, 著火等, 2. 試驗後產品特性正常. | Apply twice as rated current for 5 minutes. 通兩倍額定電流 5 分鐘 |
| voltage resistance test Reference documents: MIL-STD-202G Mthod 301 絕緣耐壓測試 | 1. During the test no breakdown 2. The characteristic is normal after test 1. 試驗過程中無擊穿 2. 試驗後產品特性正常 | 1. For parts with two coils 2. DC1000V, Current: 1mA, Time: 1Min. 1. 只針對SMT二繞組以上 2. 電壓DC1000V, 電流1mA, 時間1分鐘. |

Curve of Heat endurance of Reflow soldering test



A test is made under the conditions mentioned above. And it is left 1 hours in the normal temperature and humidity. After that, no mechanical and electrical defeat should be found out.

The reflow condition is according to the machine used by our company.