

# 承 認 書

## SPECIFICATION FOR APPROVAL

CUSTOMER:	鹿鸣
CUSTOMER P/N	
PART NO:	
DESCRIPTION:	SMD POWER INDUCTORS
PRODUCTS NO:	CYSCM1513FTL-SERIES
PRODUCTS REV:	1
DATE:	2018-7-20

PURCHASER CONFIRMED		
REMARK		

PROVIDER ENGINEER DEPT.		
APPROVAL BY	CHECK BY	DRAWN BY
		<i>chenlinli</i>



TAIPEI OFFICE

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CHINA FACTORY

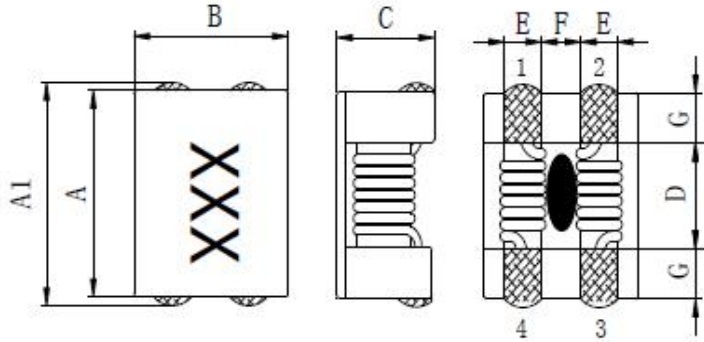
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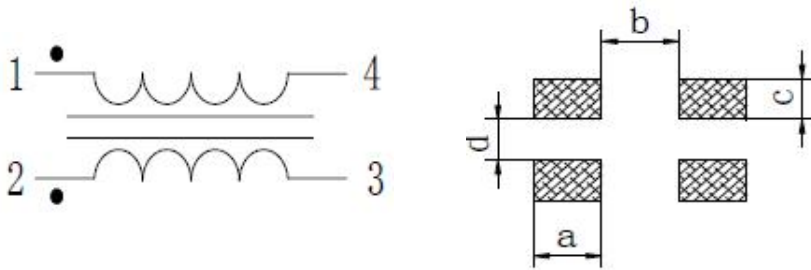
# TEST DATA

## DIMENSION&ELECTRIC CHARACTER

CUSTOMER:	鹿鸣	PART NO.:	
TOMER :	SMD INDUCTOR	SERIES NO:	CYSCM1513FTL-SERIES

**EXTERNAL DIMENSIONS****UNIT: mm**

A	15.0±0.5
A1	15.5±0.6
B	13.0±0.5
C	6.3MAX
D	9.0REF
E	2.7±0.5
F	3.8±0.5
G	3.0±0.5
a	4.20
b	8.20
c	3.10
d	3.20

**RECOMMEND LAND PATTERN DIMENSIONS**

Part NO.	Impedance (Ω)	DCR (mΩ)	Rated Current (A)	Test Freq	MARKING
CYSCM1513FTL-301	250Min (300TYP)	5 MAX	13 MAX	100MHz	301
CYSCM1513FTL-501	450Min (550TYP)	6 MAX	10 MAX	100MHz	501
CYSCM1513FTL-551	450Min (550TYP)	6 MAX	10 MAX	100MHz	551
CYSCM1513FTL-601	500Min (700TYP)	7 MAX	10 MAX	100MHz	601
CYSCM1513FTL-701	500Min (700TYP)	7 MAX	10 MAX	100MHz	701
CYSCM1513FTL-102	750Min (1000TYP)	12 MAX	9 MAX	100MHz	102

Rated Current:  $\Delta T \cong 40^{\circ}\text{C}$  Typ**NOTE:**Operating temperature:  $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$ storage : 温度:  $0^{\circ}\text{C} \sim +40^{\circ}\text{C}$  湿度: RH10%~70%

APPROVED BY: Vincent

CHECKED BY: Yasir

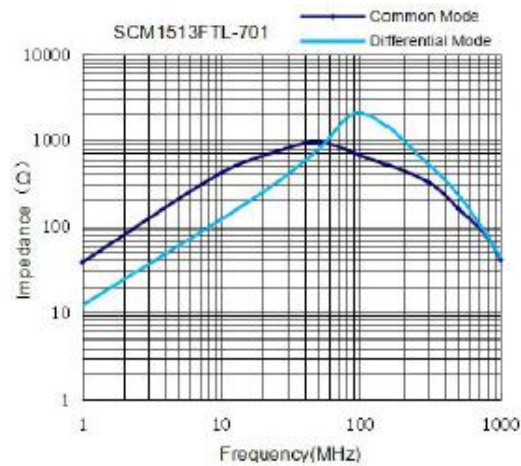
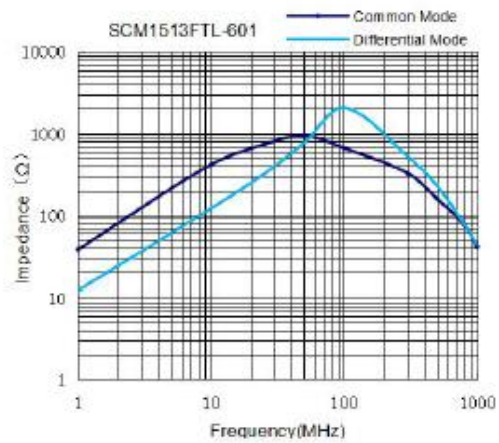
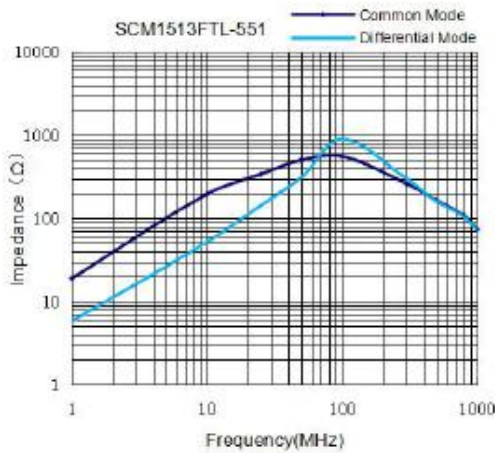
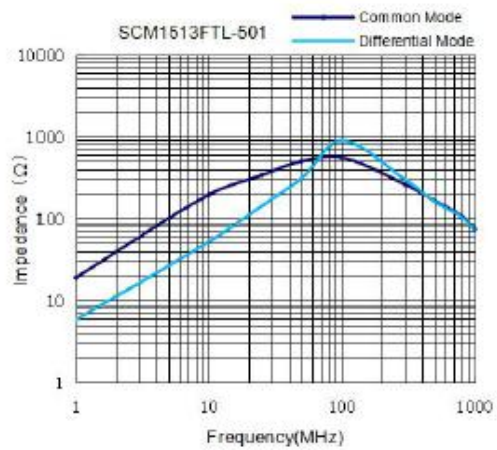
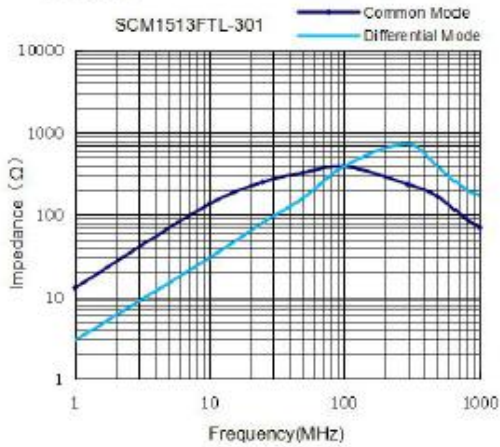
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# TEST DATA

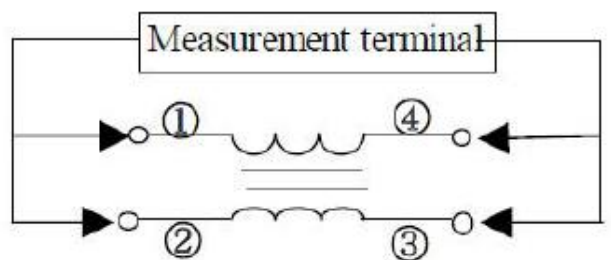
## DIMENSION&ELECTRIC CHARACTER

CUSTOMER :	鹿鸣	PART NO.:	
TOMER :	SMD INDUCTOR	SERIES NO:	CYSCM1513FTL-SERIES

**Curve**



**Impedance TEST EQUIPMENT**



APPROVED BY	CHECKED BY	PREPARED BY
Vincent	Yasir	chenlinli

# TEST DATA

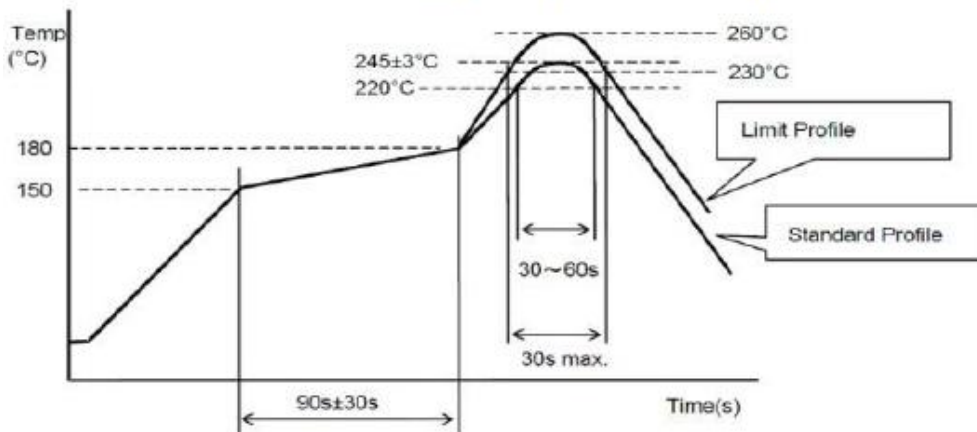
## DIMENSION&ELECTRIC CHARACTER

CUSTOMER :	鹿鸣	PART NO.:	
TOMER :	SMD INDUCTOR	SERIES NO:	CYSCM1513FTL-SERIES

### Material List

No.	Item	Material	Specification	Supplier	UL
a	Core	Ferrite core	I CORE	FYE OR EQU	
b	Wire	Enamelled copper wire	G1P180	ELEKTRISOA OR EQU	E258243
c	Base	Plastic	E4008MRB	SUMITOMO OR EQU	
d	Adhesive	Epoxy resin	ST-500	SANTONG OR EQU	
e	Terminal	Sn /Cu	Sn99.3:Cu0.7	THOUSAND OR EQU	

### Recommended Soldering Temperature Graph

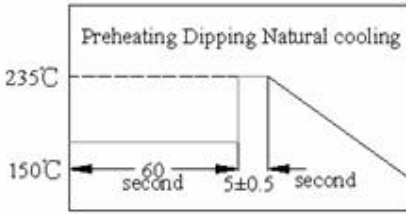
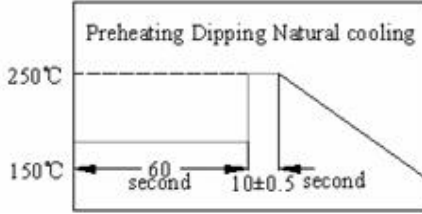
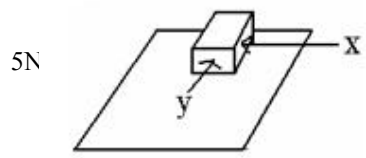


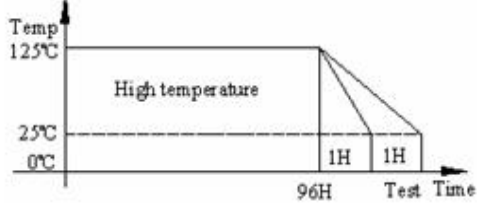
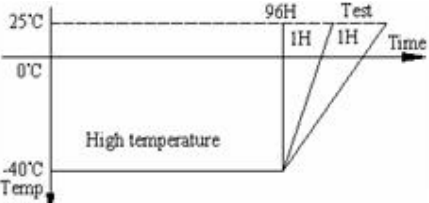
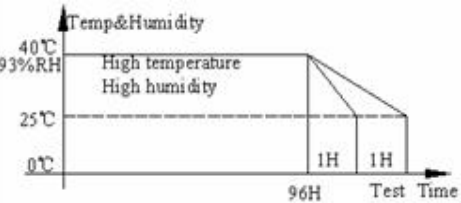
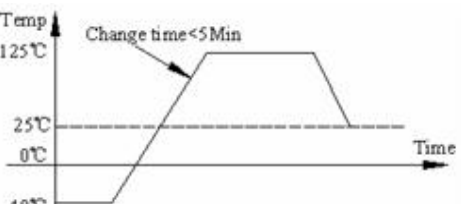
	Standard Profile	Limit Profile
Pre-heating	150~180°C、90s±30s	
Heating	above 220°C、30s-60s	above 240°C、30s max
Peak temperature	245°C±3°C	260°C、10s
Cycle of reflow	2 times	2 times

### Product photos



APPROVED BY	CHECKED BY	PREPARED BY
Vincent	Yasir	chenlinli

Operation Temperature	-40°C to +125°C (Includes temperature when the coil is heated)
External Appearance	On visual inspection, the coil has no external defects.
Solder Ability Test	<p>More than 90% of terminal electrode should be covered with solder.</p> <p>1 After fluxing, component shall be dipped in a melted solder bath at 235°C ± 5°C for 5 ± 0.5 seconds.</p> 
Heat endurance of Soldering	<p>1. Components should have not evidence of electrical and mechanical damage.</p> <p>2. Inductance: within ±10% of initial value.</p> <p>3. Impedance: within ±10% of initial value.</p> <ul style="list-style-type: none"> <li>● Preheat: 150±5°C 60seconds.</li> <li>● Solder temperature: 250±5°C.</li> <li>● Flux: rosin.</li> <li>● Dip time: 10±0.5seconds.</li> </ul> 
Terminal Strength	<p>After soldering of X,Y withstanding at below conditions .The terminal should not Peel off. (Refer to figure at below)</p> 
Insulating Resistance	Over 100MΩ at 100V D.C. between coil and core.
Dielectric Strength	No dielectric breakdown at 30V D.C. for 1 minute between coil and core.
VibrationTest	Inductance deviation within +10% after vibration for 1 hour. In each of three orientations at sweep vibration(10~55~10HZ)with 1.5mmP-P amplitudes
Drop test	Inductance deviation within +10% after being dropped once with 981m/s <sup>2</sup> (100G) shock Attitude upon a rubber block method shock testing machine, in three different orientations
<p>v Application Notice/Handling</p> <p><b>1. Storage Conditions</b>                  To maintain the solder ability of terminal electrodes:                  (1) Temperature and humidity conditions: less than 40°C and 70% RH.                  (2) Products should be used within 6 months.                  (3) The packaging material should be kept where no chlorine or sulfur exists in the air.</p> <p><b>2. Handling</b>                  (1) Do not touch the electrodes(soldering terminals)with fingers as this may lead to deterioration of solderability.                  (2) The use of tweezers or vacuum pick-ups is strongly recommended for individual components.                  (3) Bulk handling should ensure that abrasion and mechanical shock are minimized.</p>	

TEST	Required Characteristics	Test Method/Condition
<p>High Temperature Storage Test</p> <p>Reference documents: MIL-STD-202G Method108A</p>	<p>1. No case deformation or change in appearance 2. <math>\Delta L/L \leq 10\%</math> 3. <math>\Delta Q/Q \leq 30\%</math> 4. <math>\Delta DCR/DCR \leq 10\%</math></p>	 <p>Temperature: <math>125^{\circ}\text{C} \pm 2^{\circ}\text{C}</math> Time: <math>96 \pm 2</math> hours. Tested not less than 1 hour, nor more than 2 hours at room.</p>
<p>Low Temperature Storage Test</p> <p>Reference documents: IEC 68-2-1A 6.1 6.2</p>	<p>1. No case deformation or change in appearance 2. <math>\Delta L/L \leq 10\%</math> 3. <math>\Delta Q/Q \leq 30\%</math> 4. <math>\Delta DCR/DCR \leq 10\%</math></p>	 <p>Temperature: <math>-40^{\circ}\text{C} \pm 2^{\circ}\text{C}</math> Time: <math>96 \pm 2</math> hours. Tested not less than 1 hour, nor more than 2 hours at room.</p>
<p>Humidity Test</p> <p>Reference documents: MIL-STD-202G Method103B</p>	<p>1. No case deformation or change in appearance 2. <math>\Delta L/L \leq 10\%</math> 3. <math>\Delta Q/Q \leq 30\%</math> 4. <math>\Delta DCR/DCR \leq 10\%</math></p>	 <p>1. Dry oven at a temperature of <math>40^{\circ}\text{C} \pm 2^{\circ}\text{C}</math> for 96hours 2. Measurements At the end of this period 3. Exposure: Temperature: <math>40^{\circ}\text{C} \pm 2^{\circ}\text{C}</math>. Humidity: <math>93 \pm 2</math>hoys. 4. Tested while the chamber. 5. Tested not less than 1 hour. Nor more than 2 hours at room temperature.</p>
<p>Thermal Shock Test</p> <p>Reference documents: MIL-STD-202G Method107G</p>	<p>1. No case deformation or change in appearance 2. <math>\Delta L/L \leq 10\%</math> 3. <math>\Delta Q/Q \leq 30\%</math> 4. <math>\Delta DCR/DCR \leq 10\%</math></p>	 <p>First <math>-40^{\circ}\text{C}</math> for 30 Minutes, last <math>125^{\circ}\text{C}</math> for 30 Minutes as 1 cycle. Go through 20 cycles.</p>

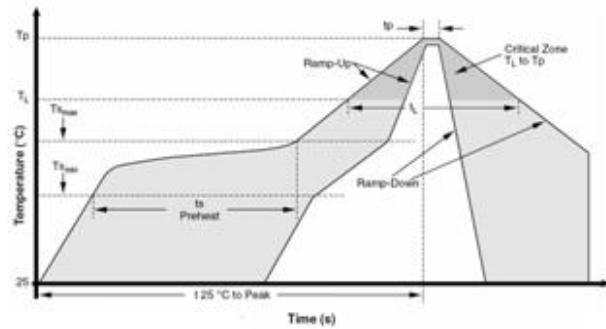
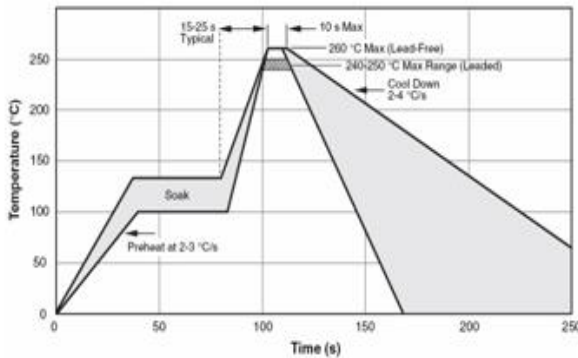
■ Application Notice/Handling

- (1) Temperature and humidity conditions : less than  $40^{\circ}\text{C}$  and 70% RH.
- (2) Products should be used within 6 months.
- (3) The packaging material should be kept where no chlorine or sulfur exists in the air.
- (4) Do not touch the electrodes (soldering terminals) with fingers as this may lead to deterioration of solder ability
- (5) The use of tweezers or vacuum pick-ups is strongly recommended for individual components.
- (6) Bulk handling should ensure that abrasion and mechanical shock are minimized.



TYPICAL WAVE SOLDER PROFILE FOR LEADED AND LEAD-FREE THROUGH-HOLE PACKAGES

TYPICAL IR REFLOW PROFILE FOR LEADED AND LEAD-FREE SURFACE MOUNT PACKAGES



IPC/JEDEC J-STD-020C, Figure 5-1

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average Ramp-Up Rate (Ts <sub>max</sub> to Tp)	3 °C/second max.	3 °C/second max.
Preheat		
± Temperature Min (Ts <sub>min</sub> )	100 °C	150 °C
± Temperature Max (Ts <sub>max</sub> )	150 °C	200 °C
± Time (ts <sub>min</sub> to ts <sub>max</sub> )	60-120 seconds	60-180 seconds
Time maintained above:		
± Temperature (T <sub>l</sub> )	183 °C	217 °C
± Time (t <sub>l</sub> )	60-150 seconds	60-150 seconds
Peak/Classification Temperature (Tp)	See Table 4.1	See Table 4.2
Time within 5 °C of actual Peak Temperature (tp)	10-30 seconds	20-40 seconds
Ramp-Down Rate	6 °C/second max.	6 °C/second max.
Time 25 °C to Peak Temperature	6 minutes max.	8 minutes max.

Table 4. Classification Reflow Profiles (per IPC/JEDEC J-STD-020C, Table 5.2)

Note 1: All temperatures refer to top side of the package, measured on the package body surface.

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	240 +0/-5 °C	225 +0/-5 °C
≥2.5 mm	225 +0/-5 °C	225 +0/-5 °C

Table 5. SnPb Eutectic Process – Package Peak Reflow Temperatures (per IPC/JEDEC J-STD-020C, Table 4.1)

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
<1.6 mm	260 + 0 °C *	260 + 0 °C *	260 + 0 °C *
1.6 mm - 2.5 mm	260 + 0 °C *	250 + 0 °C *	245 + 0 °C *
≥2.5 mm	250 + 0 °C *	245 + 0 °C *	245 + 0 °C *

\* Tolerance: Process compatibility is up to and including the stated classification temperature (this means Peak reflow temperature + 0 °C. For example 260 °C + 0 °C) at the rated MSL level.

Table 6. Pb-free Process – Package Classification Reflow Temperatures (per IPC/JEDEC J-STD-020C, Table 4.2)

Note 1: The profiling tolerance is + 0 °C, -X °C (based on machine variation capability) whatever is required to control the profile process but at no time will it exceed -5 °C. Process compatibility at the peak reflow profile temperatures as defined in Table 4.2.

Note 2: Package volume excludes external terminals (balls, bumps, lands, leads) and/or nonintegral heat sinks.

Note 3: The maximum component temperature reached during reflow depends on package thickness and volume. The use of convection reflow processes reduces the thermal gradients between packages. However, thermal gradients due to differences in thermal mass of SMD packages may still exist.

Note 4: Components intended for use in a “lead-free” assembly process shall be evaluated using the “lead-free” classification temperatures and profiles defined in Tables 4.1, 4.2 and 5.2 whether or not lead free.



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