ROHS Compliant

承　認　書

SPECIFICATION FOR APPROVAL

CUSTOMER:	
CUSTOMER P/N	
PART NO:	
DESCRIPTION:	*SMD POWER INDUCTORS*
PRODUCTS NO:	BCRH104R-150M
PRODUCTS REV:	*01*
DATE:	*2018-6-11*

PURCHASER CONFIRMED.		
APPROVAL BY	*CHECK BY*	*DRAWN BY*
REMARK		

PROVIDER ENGINEER DEPT.		
APPROVAL BY	*CHECK BY*	
		chenlinli

誠 陽 實 業 有 限 公 司

TAIWAN CHENG YANG COMPONENT CORP
2F-1, NO. 176, Chine-Yi Road., Zhonghe District, New Taipei City, TAIWAN(R.O.C)
新北市中和區建一路 176 號 2 樓之一
POSTAL CODE: 23500
TEL NO.:+886-2- 8228-0930 FAX NO.:+886-2-8228-0929 E-mail:h21803@ms29.hinet.net

TAIPEI OFF ICE

寶 誠 電 子 有 限 公 司

ZHUHAI BAO CHENG ELECTRONICSCO.,LTD
Guan Tang Industrial Park, Tang Jia Wan Town, Zhuhai City, Guangdong Province, CHINA
中國廣東省珠海市塘家灣鎮官塘工業區
POSTAL CODE: 519085
TEL NO:86-756-3383187 FAX NO:86-756-3380704 E-mail: baocheng@baocheng.biz

CHINA FACTORY

昆 山 誠 陽 電 子 有 限 公 司

KUNSHAN CHENG YANG ELECTRONICSCO.,LTDP
Qiang-An Road., High-Tech. Industrial Park, Kunshan City, Jiangsu Province, China
江蘇省昆山市高科技工業園區強安路 35 號
POSTAL CODE: 215300
TEL NO:86-512-57823500 FAX NO:86-512-57823503 E-mail: kscy@taiwan-chengyang.com.tw

CHINA FACTORY

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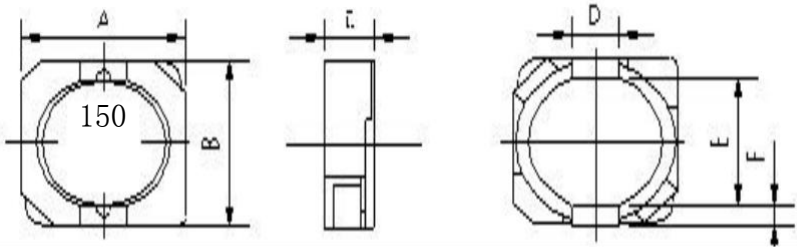
TEST DATA
DIMENSION&ELECTRIC CHARACTER

CUSTOMER:		PART NO.:	
DESCRIPTION:	SMD INDUCTOR	SERIES NO:	BCRH104R-150M

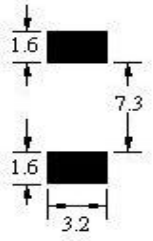
1.MECHANICAL DIMENSION



UNIT:mm

A	10.3MAX
B	10.5MAX
C	4.0MAX
D	3.0±0.1
E	7.7±0.3
F	1.2±0.15
G	
H	
I	

2.RECOMMEND LAND PATTERN DIMENSIONS



3.SEPCIFICATIONS

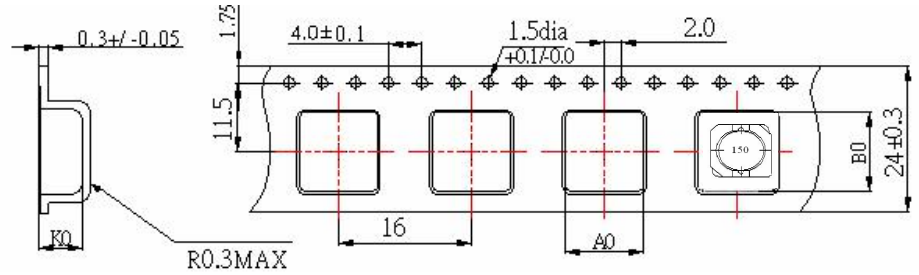
Part Number	L Inductance (uH) @(0A)	R_{dc} (mOHM)		Heat Rating Current DC Amps. Idc(A)	Saturation Current DC Amps. Idc(A)
		Typical	Max	Typical	Typical
BCRH104R-150M	15.0	44	50	3.1	3.6

(1). All test data is referenced to 25℃ ambient.
(2). Operating Tenperature Rangr-30℃ to +100℃.
(3). DC current(A)that will cause an approaimate△T of 40℃.
(4). DC current(A)that will cause Lo to drop approximately 35%.
(5). The part temperature(ambient+temp rise)should not exeed 100℃ under worst case operating conditions.Circuit design,component placement,PWB trace size and thickness,airflow and oter aooting provisions all affsct the part temperature part temperature should be verified in the end appliation.

4.PACKAGING INFORMATION

paets are packaged on 13″reels
800 parts per reel.

A0= 10.3mm
B0=10.5mm
K0=4.1mm



APPROVED BY: CHECKED BY: DRAWN BY:chenlinli

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ZHUHAI BAOCHENG ELECTRONICS CO.,LTD
TEST DATA FOR PREPRODUCTION SAMPLE

CUSTOMER:			CUSTOMER P/N:				CUSTOMER REV:			TEST DATE:2018-6-11	
PART NAME: SMD INDUCTOR			BC PART NO: BCRH104R-150M				BC REV:			QUANTITY:10PCS	
TEST ITEM	A	B	C	D	E	F	G	H	I	J	K
SPEC.	10.3	10.5	4.0								
	MAX	MAX	MAX								
01	10.00	10.25	3.81								
02	9.99	10.24	3.79								
03	10.00	10.28	3.83								
04	10.03	10.29	3.82								
05	10.19	10.31	3.82								
06	10.18	10.38	3.79								
07	10.05	10.29	3.83								
08	10.06	10.19	3.81								
09	10.18	10.32	3.86								
10	10.09	10.27	3.84								
11											
12											
13											
14											
15											
$\overline{X}$	10.08	10.28	3.82								
σ	0.075	0.048	0.020								
Cpk	0.99	1.50	2.93								

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ZHUHAI BAOCHENG ELECTRONICS CO.,LTD
TEST DATA FOR PREPRODUCTION SAMPLE

CUSTOMER:		CUSTOMER P/N:		CUSTOMER REV:		TEST DATE:2018-6-11
PART NAME: SMD INDUCTOR		BC PART NO: BCRH104R-150M		BC REV:		QUANTITY:10PCS
TEST ITEM	L(0A)	L(3.6A)/L(0A)*100%	DCR(S-F)			
TEST CONDITION	100KHZ 0.25V					
SPEC.	15uH ±20%	= 65% AT DC 3.6A	50mΩ			
01	14.36	73%	43.66			
02	14.22	78%	44.52			
03	15.84	80%	45.78			
04	14.67	78%	44.23			
05	15.06	75%	43.43			
06	14.05	89%	42.89			
07	15.85	80%	42.56			
08	14.82	78%	44.83			
09	14.75	79%	45.18			
10	14.32	73%	43.81			
11						
12						
13						
14						
15						
$\overline{X}$	14.79		44.09			
σ	0.600		0.963			
Cpk	2.39		2.05			

1. TEST INSTRUMENTS:
- ☐HP-4284A METER
- ■HP-4285A METER
- ☐HP-4191A METER
- ☐VR116+VR7220 METER
- ☐CH-3200 METER
- ☐CH-310 METER
- ☐CH-3305 METER
- ■CD1068+CD1320 METER
- ☐VR113+VR712+R712 METER
- ☐WK3260B+WK3265B METER
- ☐VR562 METER
- ■CH-502B DCR METER

2. CONDITION
TEMPERATURE: 25℃
HUMIDITY: 65%RH

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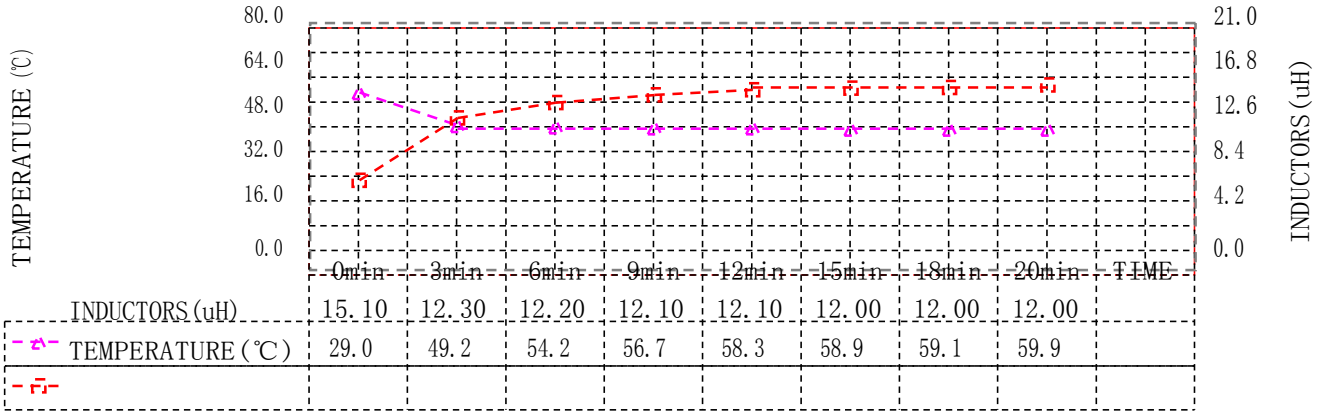
ELECTRONICS CHARACTER TEST CHART

CUSTOMER:		CUSTOMER P/N:	TEST DATE:2018-6-11
PART NAME:	SMD INDUCTOR	BC P/N: BCRH104R-150M	SAMPLE CO:

TEMPERATURE RISE CURRENT	DC:3.1A	TEST INSTRUMENTS	CD1068+CD1320 METER

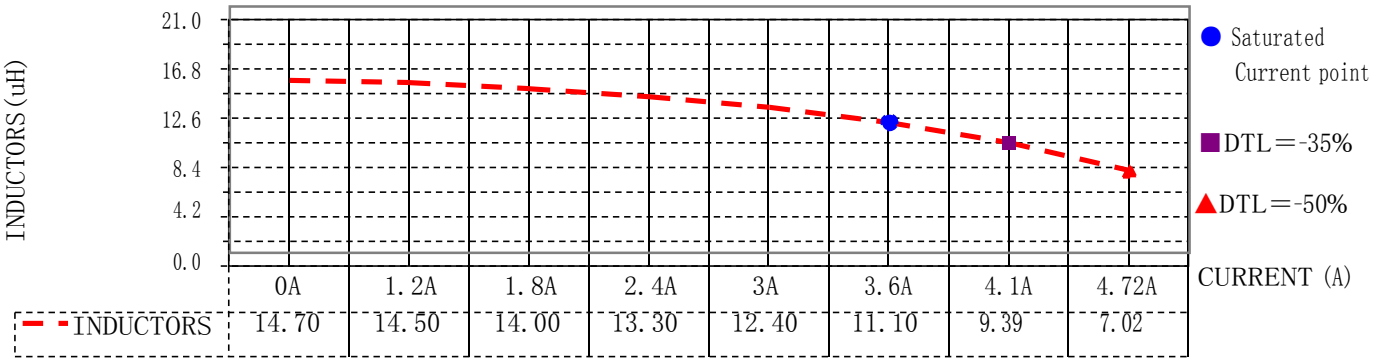
1. CURVES OF TEMPERATURE AND INDUCTAME VARIED WITH TP CARRENT



	0min	3min	6min	9min	12min	15min	18min	20min	TIME
INDUCTORS (uH)	15.10	12.30	12.20	12.10	12.10	12.00	12.00	12.00	
TEMPERATURE (℃)	29.0	49.2	54.2	56.7	58.3	58.9	59.1	59.9	

TEST TERM:	100KHZ 0.25V	TEST INSTRUMENTS:	WK3260B+WK3265B METER

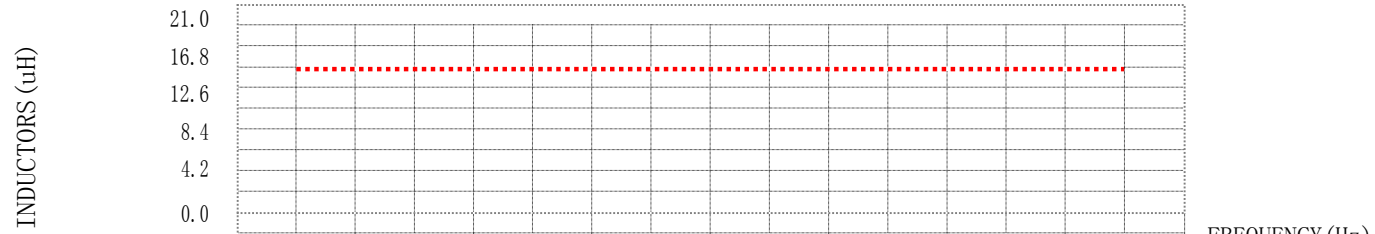
2. INDUCTCMCE VS CURRENT



	0A	1.2A	1.8A	2.4A	3A	3.6A	4.1A	4.72A
INDUCTORS	14.70	14.50	14.00	13.30	12.40	11.10	9.39	7.02

TEST TERM:	0.25V	TEST INSTRUMENTS:	WK3260B+WK3265B METER

3. INDUCTCMCE VS FREQUENCUY



	1KHz	10KHz	50KHz	100KHz	300KHz	500KHz	800KHz	1MHZ
INDUCTORS	15.30	15.20	15.10	14.90	14.80	14.70	14.60	14.50

1. TEST CONDITION
TEMPERATURE: 25℃
HUMIDITY: ≦ 65% RH

APPROVED BY	CHECKED BY	PREPARED BY
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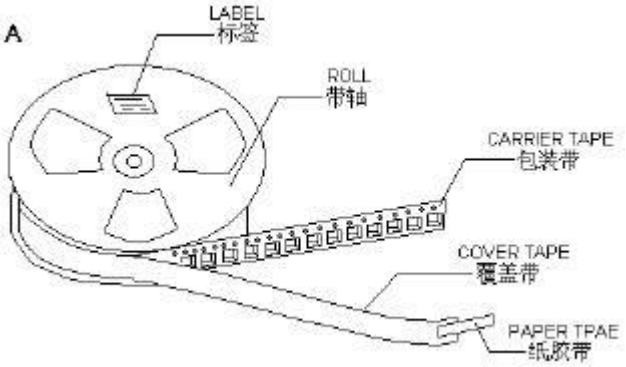
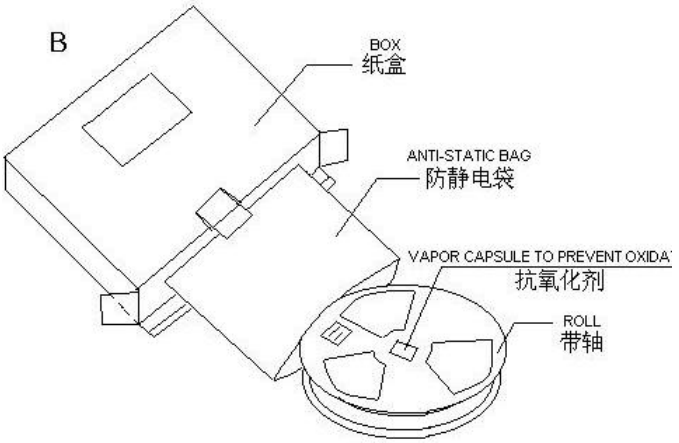
PACKAGE STANDARD

PART NO.	BCRH104R SERIES

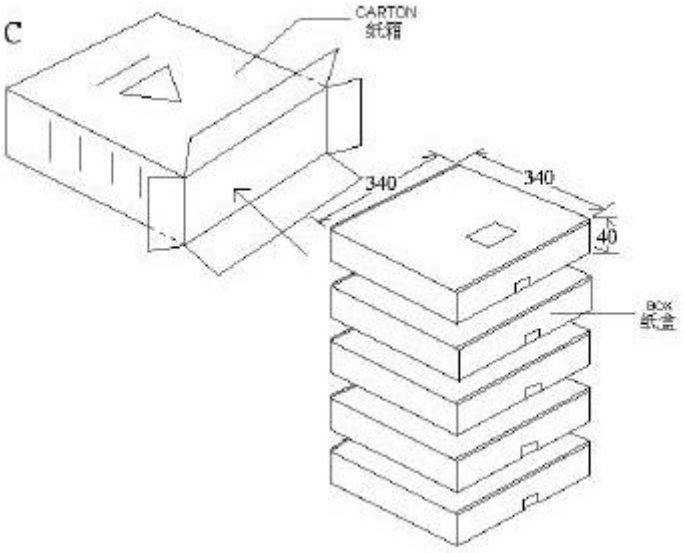
A



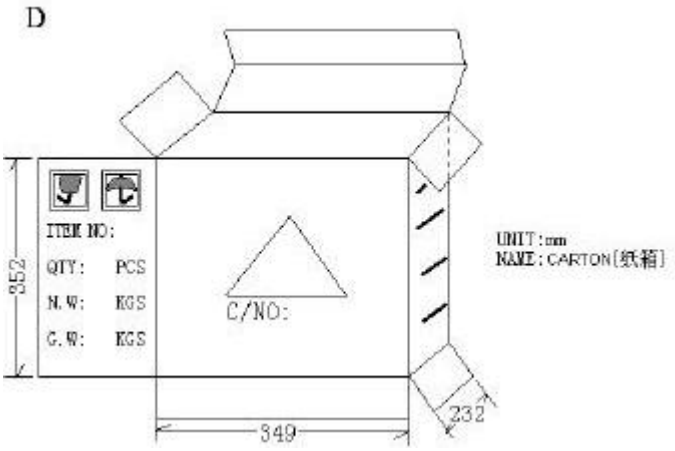
B



C

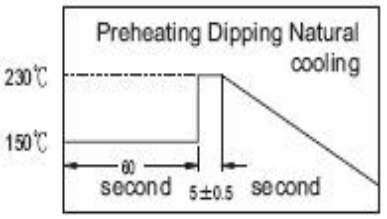
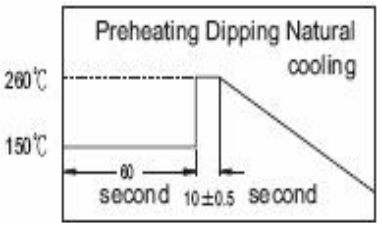
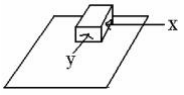


D



NO	A	B	C
MODEL	ϕ 330*24	SMD-BC	BC-10
QUANTITY	800PCS	800PCS	4000PCS

■GENERAL CHARACTERISTICS

Operation Temperature	-30℃ to +100℃ (Includes temperature when the coil is heated)
External Appearance	On visual inspection, the coil has no external defects.
Solder Ability Test	1. More than 90% of terminal electrode should be covered with solder. ● After fluxing, component shall be dipped in a melted. ● Solder: bath at 230℃±5℃ for 5±0.5 seconds. 
Solder Heat Resistance	1. Components should have not evidence of electrical and mechanical damage. 2. Inductance: within±10% of initial value. 3. Impedance: within±30% of initial value. ● Preheat:150±5℃ 60seconds. ● Solder temperature: 260±5℃. ● Flux: rosin. ● Dip time:10±0.5seconds. 
Terminal Strength	After soldering of X,Y withstanding at below conditions .The terminal should not Peel off. (Refer to figure at below) ● 5N:60sec. BC Series, BCB Series, BCDB Series, BCEI Series BCEP Series, BCH Series, BCMD Series, BCMS Series, BCPF Series, BCPS Series BCR Series, BCRH Series, BCRHB Series, BCX Series, BCIHP Series, BCLQ72, BCRM135, BCPH73, BCC5D23, BCHP1210. ● 10N:10sec. BC73, BC75, BC4020FH, BC74B. ● 15N:10sec. BC104, BC105, BC105B, BC108, BC5022FH. ● 20N:10sec. BCR125B. 
Insulating Resistance	Over 100MO at 100V D.C. between coil and core.
Dielectric Strength	No dielectric breakdown at 100V D.C. for 1 minute between coil and core.
Vibration Resistance	Inductance deviation within ±3% after vibration for 1 hour. In each of three orientations at Sweep vibration (10~55~10HZ) with 1.5mmP-P amplitudes.
Shock Resistance	Inductance deviation within ±3% after being dropped once with 981m/s^2 (100G) shock Attitude upon a rubber block method shock testing machine, in three different orientations

■ **Application Notice/Handling**

1. Storage Conditions

To maintain the solder ability of terminal electrodes:

(1) Temperature and humidity conditions: less than 40℃ 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.

2. Handling

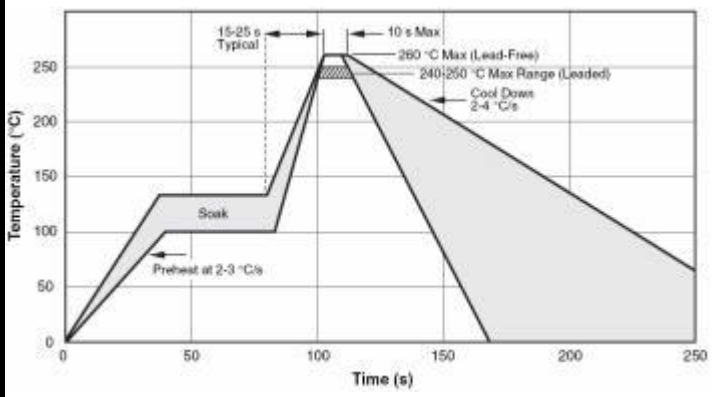
(1) Do not touch the electrodes (soldering terminals) with fingers as this may lead to deterioration of solderability.

(2) The use of tweezers or vacuum pick-ups is strongly recommended for individual components.

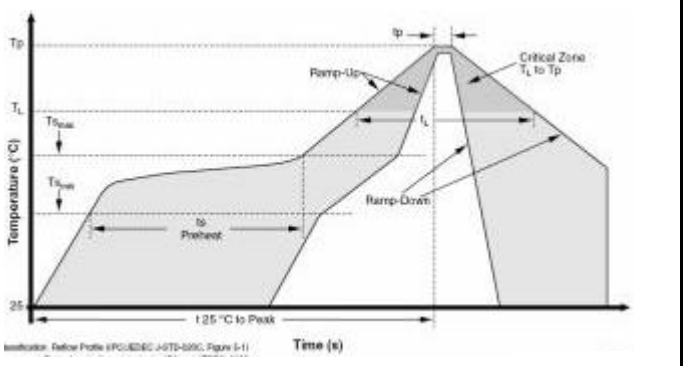
(3) Bulk handling should ensure that abrasion and mechanical shock are minimized.

■THE CONDITION OF REFLOW(RECOMMENDATION)

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_{max} to Tp)	3 °C/second max.	3 °C/second max.
Preheat ± Temperature Min (Ts_{min}) ± Temperature Max (Ts_{max}) ± Time (ts_{min} to ts_{max})	 100 °C 150 °C 60-120 seconds	 150 °C 200 °C 60-180 seconds
Time maintained above: ± Temperature (T_L) ± Time (t_L)	 183 °C 60-150 seconds	 217 °C 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 topside of the package, measured on the package body surface.

Package Thickness	Volume mm^3 <350	Volume mm^3 ≥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^3 <350	Volume mm^3 350-2000	Volume mm^3 >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)

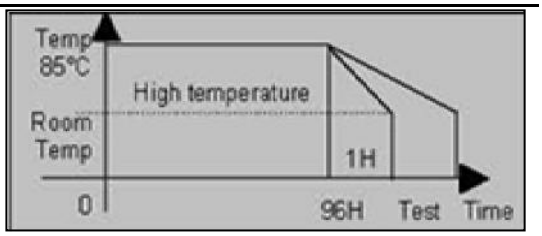
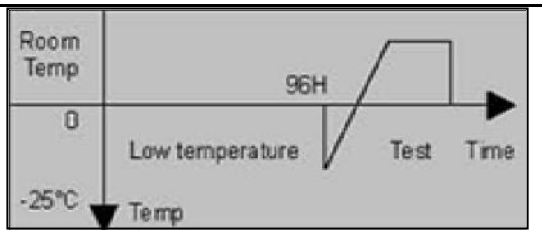
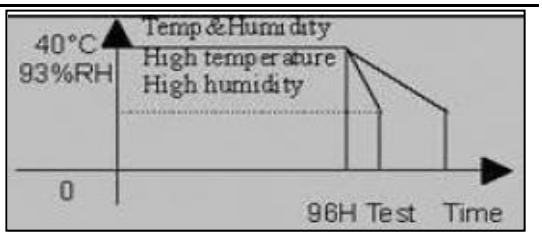
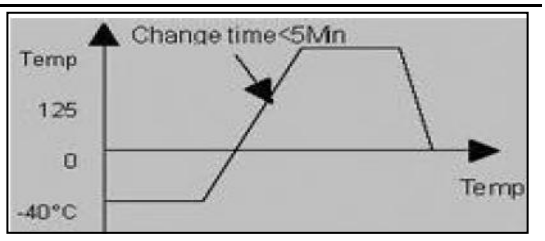
Note 1: The profiling tolerance is + 0 °C, -X °C (based on machine variation capability) whatever is required to control the profile process but at no time will it exceed -5 °C. Process compatibility at the peak reflow profile temperatures as defined in Table 4.2.

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.

GENERAL CHARACTERISTICS

TEST	Required Characteristics	Test Method/Condition
High Temperature Storage Test Reference documents: MIL-STD-202G Method 108A	1.No case deformation or change in appearance 2.△L/L≦10% 3.△Q/Q≦30% 4.△DCR/DCR≦10%	 Temperature:85℃±2℃ Time:96±2 hours. Tested not less than 1 hour, nor more than 2 hours at room.
Low Temperature Storage Test Reference documents: IEC 68-2-1A 6.1 6.2	1.No case deformation or change in appearance. 2.△L/L≦10% 3.△Q/Q≦30% 4.△DCR/DCR≦10%	 Temperature:-25℃±2℃ Time:96±2 hours. Tested not less than 1 hour, nor more than 2 hours at room.
Humidity Test Reference documents: MIL-STD-202G Method103B	1.No case deformation or change in appearance. 2.△L/L≦10% 3.△Q/Q≦30% 4.△DCR/DCR≦10%	 1. Dry oven at a temperature of 40℃±5℃ for 24 hours. 2. Measurements At the end of this period 3. Exposure: Temperature: 40℃±5℃.Humidity:93±2hoyrs. 4. Tested while the the chamber. 5. Tested not less than 1 hour. Nor more than 2 hours at room temperature.
Thermal Shock Test Reference documents: MIL-STD-202G Method107G	1. No case deformation or change in appearance. 2. △L/L≦10% 3. △Q/Q≦30% 4. △DCR/DCR≦10% For T: weight≦28g : 15Min 28g≦weight≦136g:30Min	 First – 40℃ for T time, last 125℃ T time as 1 cycle. Go through 20 cycles.

Application Notice/Handling

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

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