



功得電子工業股份有限公司
CONQUER ELECTRONICS CO.,LTD.

規格書

Spec. No. **SFA-606**

Specification For Approval

產品名稱：CQ12LI 系列

高電流型陶瓷晶片保險絲

Product Name : CQ12LI

High Current SMD L-Type Chip Fuse Series

www.conquer.com.tw

五股廠：新北市五股區五權五路26號(新北產業園區)
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History of Change

REV.	Description	Date	Drawn	Designed	Checked	Approved
1	新制定文件	2016.11.02	陳佳鈺	翁靜軒	葉志強	葉煥益
2	1. 新增36V、48V額定電壓 2. 新增IR條件： 200 amperes at 36V DC 150 amperes at 48V DC	2018.01.09	陳佳鈺	翁靜軒	葉志強	葉煥益

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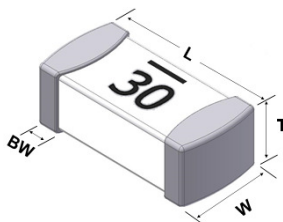
1 適用範圍

1.1 電動工具 Power Tool 【Lithium Battery,Rechargeable】

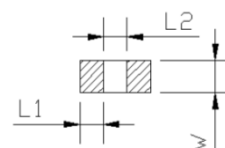
2 形狀及尺寸如下圖 單位: mm

Shape & Size as following illustrations.

Type	1206
L	3.1 ± 0.2 mm
W	1.6 ± 0.2 mm
T	0.9 ± 0.3 mm
BW	0.5 ± 0.25 mm



建議銅箔尺寸	
L1	1.10
L2	1.52
W	1.78



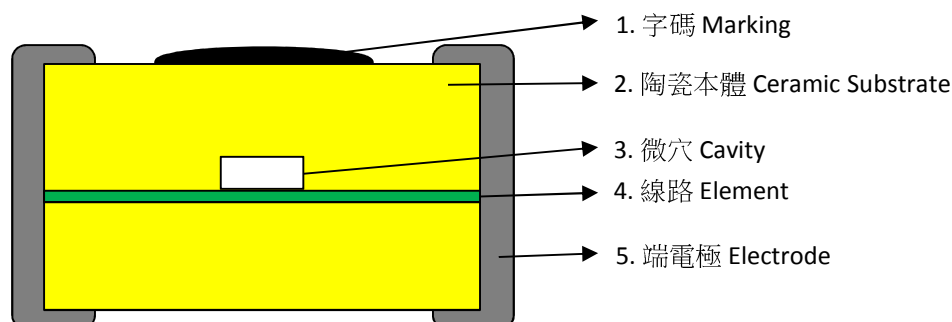
2.1 構造形狀 Structure & Shape : 如上圖 As shown in figure above

2.2 額定電壓 Rated Voltage: 10A ~ 25A : 24V / 36V / 48V / 63V

30A : 24V / 36V / 48V

2.3 額定電流 Rated Current: 10A ~ 30A

3 材料 Material :



部件編號	部件名稱		組成材料
1	字碼	Marking	玻璃 Glass Powders
2	陶瓷本體	Ceramic Substrate	陶瓷 Ceramic
3	微穴	Cavity	空氣 Air
4	線路	Element	銀 Ag
5	端電極	Electrode	銀 Ag、鎳 Nickel、錫 Tin



4 電氣特性 Electrical Characteristics :

- 4.1 負載容量: 通過額定電流值 100 % (亦即 $1.0 \times I_n$ A) 4小時以上，能繼續通電無任何熔化現象。

Loading Capacity : Through the 100 % rating current ($1.0 \times I_n$ A) loading, and keep current continuously without any melting. (Can keep 4 hours minimum)

- 4.2 溫度特性: 通過額定電流值100%(亦即 $1.0 \times I_n$ A) 1.5小時，繼續維持原加之電流，每隔十分鐘測試一次，連續測三次，溫度不得升高，若使用熱偶式測量方法。(Thermocouple method) 則本體溫升在200°C 以下。

Temperature: Loading the 100 % ($1.0 \times I_n$ A) for 1.5 hours, keep testing it with the original current every 10 minutes. Continue to test it for 3 times. The temperature is not allowed to be higher. The main temperature rise is below 200°C by way of Thermocouple Method.

- 4.3 過載熔斷: 請參照下表。Melting due to overloading: Details as follows Table.

※最大熔斷時限Operating Characteristics

安培數	100% Rating		350% Rating	
Rating	Min.	Max.	Min.	Max.
10A ~ 30A	4 hr			5 sec

5 遮斷能力 Interrupting rating :

10A ~ 25A : 100 amperes at 63V DC

250 amperes at 24V DC

30A : 300 amperes at 24V DC

UL pending

10A ~ 30A : 200 amperes at 36V DC

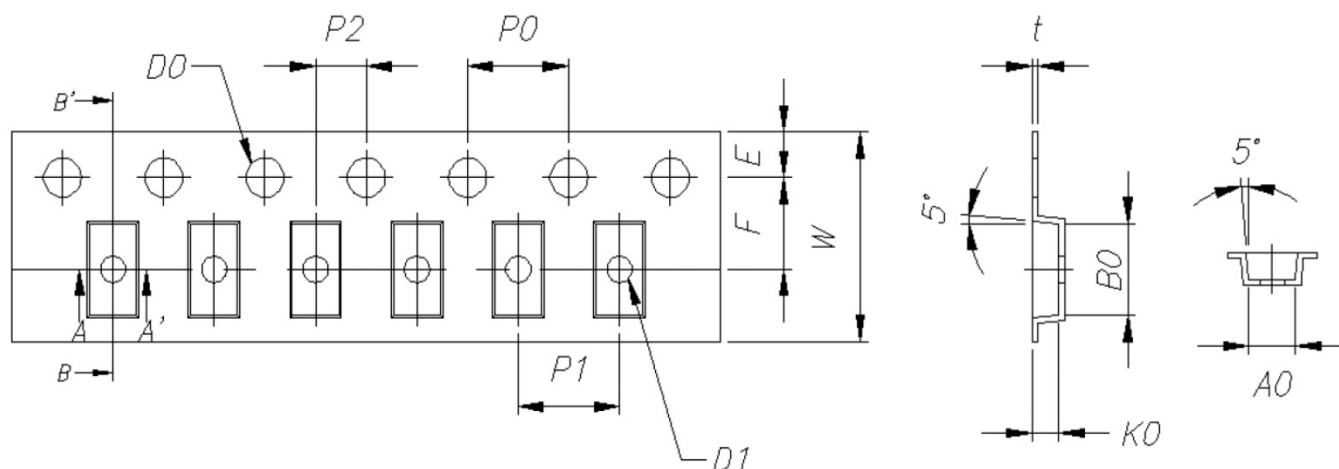
150 amperes at 48V DC

- 6 包裝 : 4000 pcs (7'') in an inner box. 內盒印明下列標示:料號、額定(電壓、電流、遮斷能力)及安規名稱。包裝材料均符合RoHS或者HF的環保要求, 且包裝材料不會和零件發生化學反應，造成不良。

Packing : 4000 pcs (7'') in an inner box. The following items indicated on the box.

Mark: Catalog number; ratings (voltage, current, interrupting capacity), and safety mark.

The packing material conforms to ROHS or the HF environmental protection request. And the packing material can't have the chemical reaction with the components.



Item	W	E	F	D0	D1	P0	P1	P2	P0 x 10	t	A0	B0	K0
Criterion	8.00	1.75	3.50	1.50	1.00	4.00	4.00	2.00	40.00	0.23	1.85	3.50	1.04
Tolerance	± 0.20	± 0.10	± 0.05	± 0.10	± 0.10	± 0.05	± 0.10	± 0.05	± 0.20	± 0.05	± 0.10	± 0.10	± 0.10

7 其他 Other :

7.1 除非另有指定，上述機械、電器特性，係於常溫，標準狀況下測試之。

Unless otherwise, specified, all tests to be performed at $25 \pm 5^\circ\text{C}$ and 35-75% RH.

7.2 於標準狀況下儲放一年，本品乃確保上述機械與電氣之特性。

After one year's storage under normal condition, this item is guaranteed to meet the requirements mentioned above.

8 標記/安規認證 Mark/ Safety certification :

8.1 標記 Mark

貼紙 Label

尺寸規格	FUSE 3.2X1.6mm	Q.C PASS:	(Pb)
型號	Model: CQ12LI	Specification:	A V
存貨料號	1LI*****	DATE:	Q'TY:
通過的規範	UL248-1	Breaking Capacity	
存貨名稱	High Current Ceramic Chip Fuse		
安規	  CONQUER ELECTRONICS CO., LTD. TAIPEI TAIWAN		

數量
遮斷能力

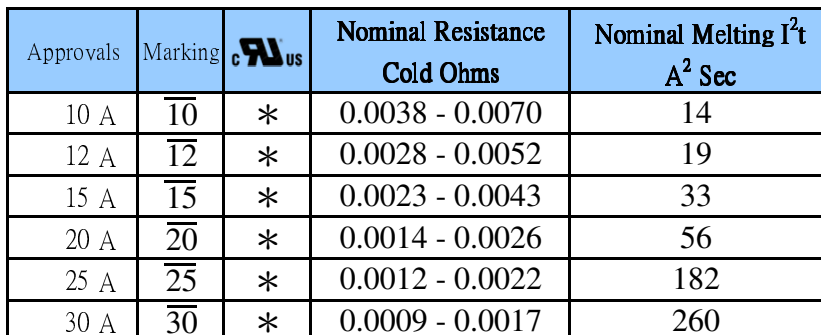
Product Name	Ampere Rating	IR
CQ12LI *A 63V	10A ~ 25A	100A 63V DC
CQ12LI *A 24V	10A ~ 25A	250A 24V DC
CQ12LI 30A 24V	30A	300A 24V DC

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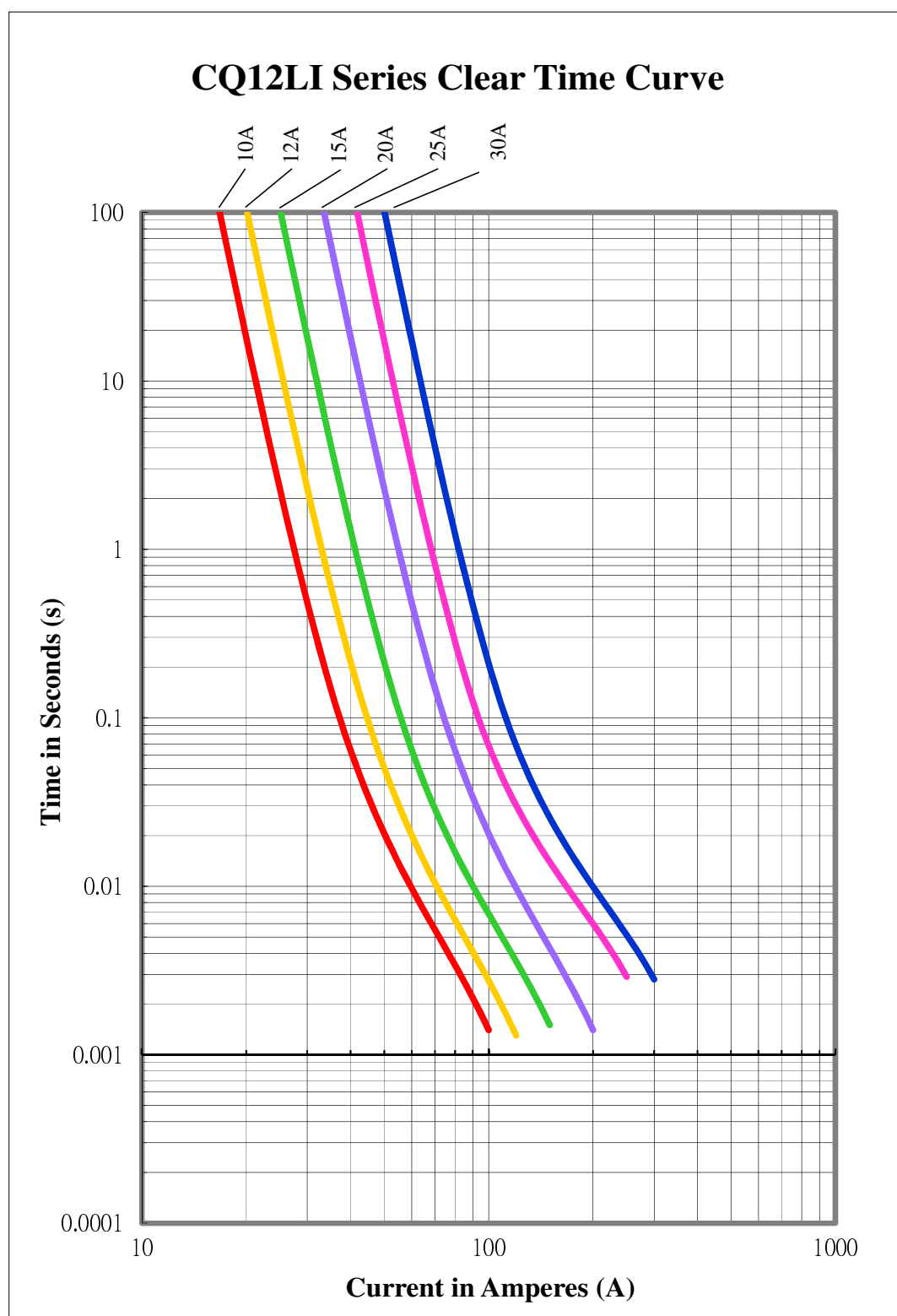


8.2 UL cRU認證，認證號碼：E82636。
Recognized to meet UL cRU. File No:E82636

品名	安培數
CQ12LI __A __V	10A ~ 30A

1 系列品名 Series Model : CQ12LI
2 安培數 Ampere Rating : 10A ~ 30A
3 伏特數 Voltage 10A ~ 25A : 24V / 36V / 48V / 63V
30A : 24V / 36V / 48V

10 IT 曲線圖 Clear Time Curve(I vs t curve) :



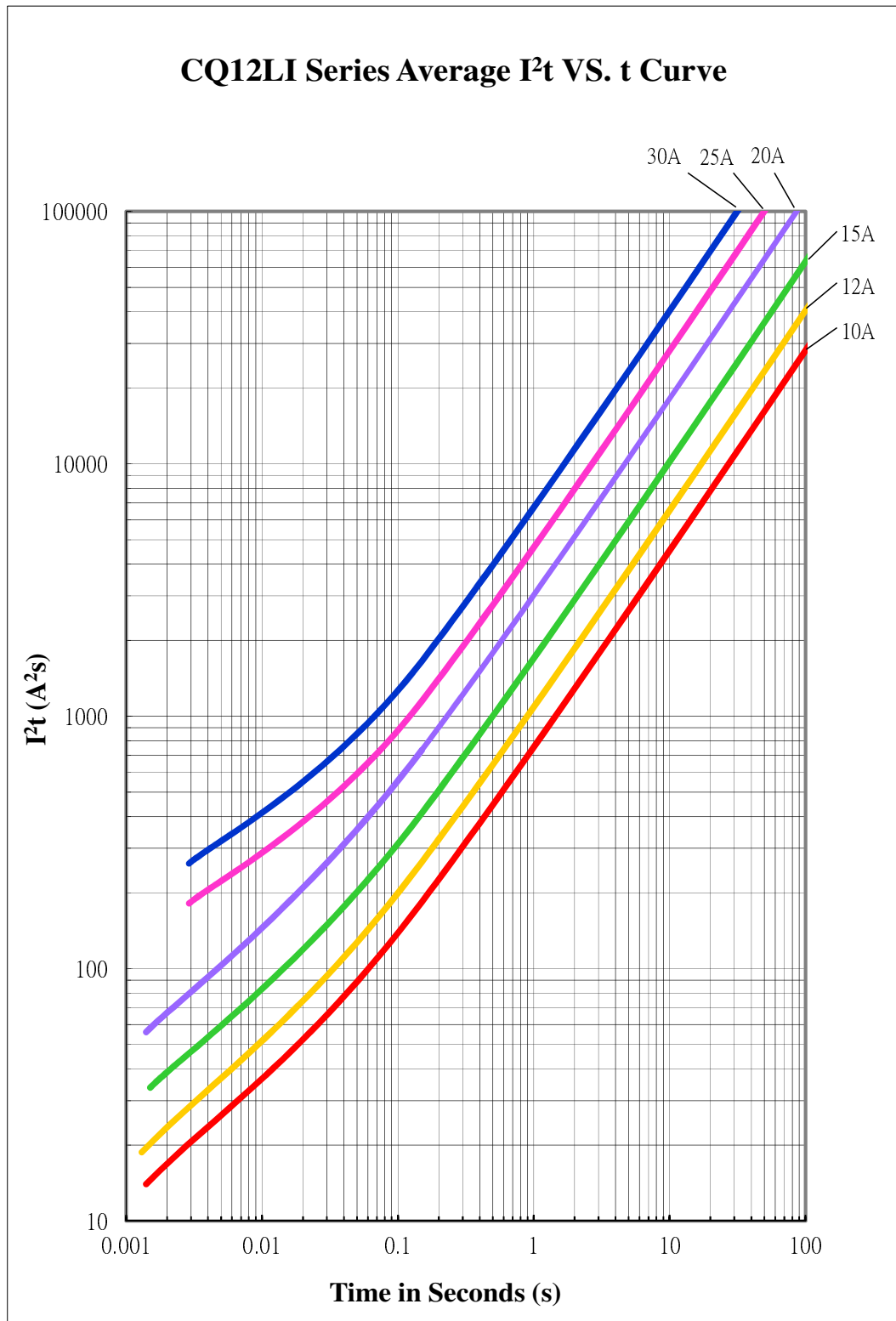
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11 I^2t 曲線圖 Standing Pulse(I^2t vs t curve) :



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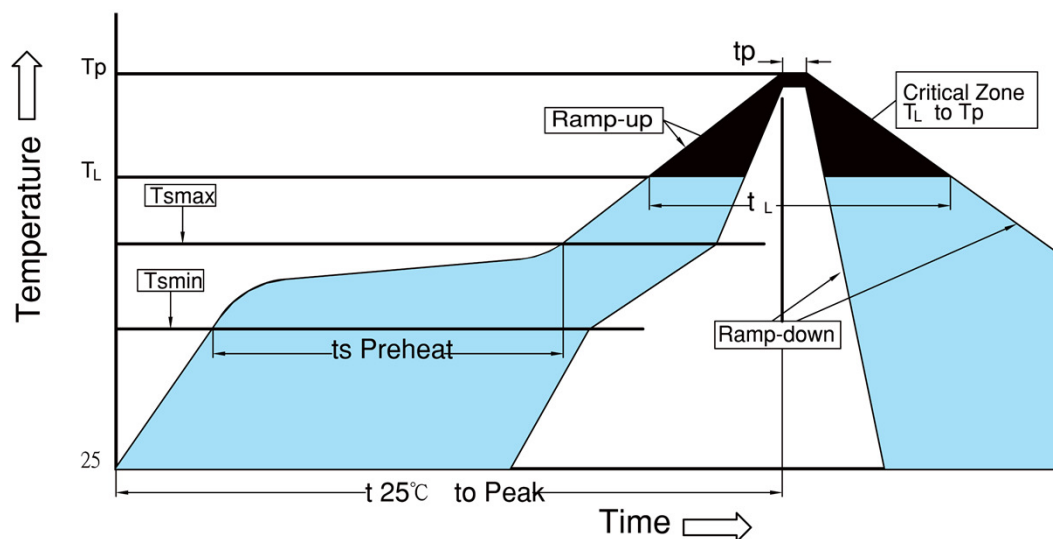
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12 焊接方法 Soldering Method :

- 13.1 手焊 Hand soldering : 350°C, 3 Sec. max
- 13.2 波焊 Wave soldering : 260°C, 10 Sec. max
- 13.3 迴焊 Reflow soldering : 260°C, 30 Sec. max

13 迴焊建議曲線圖 Recommended Reflow Soldering Curve :



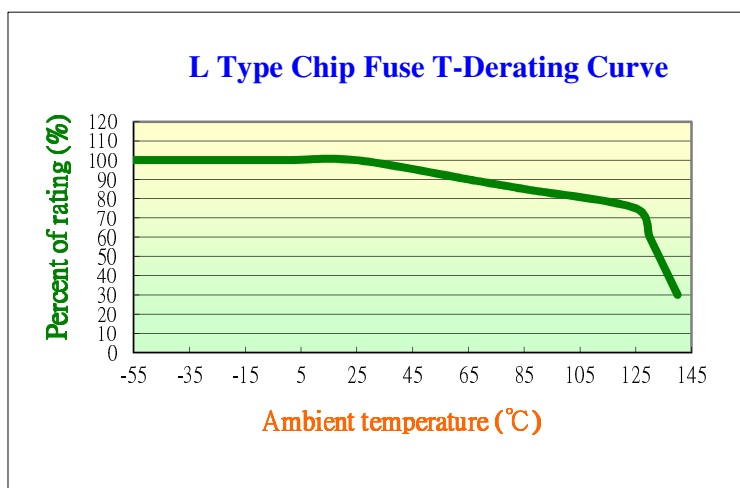
Reflow Condition		Pb-free assembly
Pre Heat	Temperature Min ($T_{s \text{ (min)}}$)	150°C
	Temperature Max ($T_{s \text{ (max)}}$)	200°C
	Time (Min to Max) (t_s)	60-180 seconds
Average Ramp-up Rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{s \text{ (max)}}$ to T_L -Ramp-up Rate		5°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (t_L)	60-150 second
Peak Temperature (T_P)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		10 ~ 30 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature ($t_{25^\circ\text{C to peak}}$)		8 minutes max
Do not exceed		260°C

14 L-TYPE 溫度曲線圖 Temperature Derating curve :

14.1 環境溫度對應電流承載能力，請參照下曲線圖。

Ambient temperature on current-carrying capacity.Details as follows curve.

14.2 工作溫度 Operating Temperature Range : $-55^{\circ}\text{C} \sim 125^{\circ}\text{C}$



15 信賴性規範 Product Characteristics & Reliability Tests :

Test item	Test Description & Reference
Humidity unload test	MIL-STD-202G , Method 103B , Test Condition A Heat ($40 \pm 0.5^{\circ}\text{C}$) & High Humidity ($95 \pm 1\%$ RH) , 240 hours , $\Delta R < 15\%$
Thermal shock test	MIL-STD-202G, Method 107G , Test Condition B Temperature setup : $25^{\circ}\text{C} \sim -65^{\circ}\text{C} \sim 25^{\circ}\text{C} \sim 125^{\circ}\text{C}$ Time setup : -65°C (30min) $\sim 25^{\circ}\text{C}$ (5min) $\sim 125^{\circ}\text{C}$ (30min) $\sim 25^{\circ}\text{C}$ (5min) • 5 cycles , $\Delta R < 15\%$
Vibration test	MIL-STD-202G , Method 201A Frequency setup : $10 \sim 55 \sim 10\text{ Hz}$ Time setup : 1 Minute/cycle (X-Y-Z , 120 Cycles , 6hours) • $\Delta R < 15\%$
Salt spray Test	MIL-STD-202G , Method 101E , Test Condition A Salt spray concentration : $5 \pm 1\%$ Test liquid temperature : $35 \pm 0.5^{\circ}\text{C}$ 96hours , $\Delta R < 15$
Solderability test	Reference IEC 68-2-58 Temperature setup : $235 \pm 5^{\circ}\text{C}$, $2 \pm 0.2\text{ sec}$ After test terminal electrode wetting area must be greater than 95%
Resistance to Soldering Heat Test	Reference IEC 68-2-58 Temperature setup : $260 \pm 5^{\circ}\text{C}$, $10 \pm 1\text{ sec}$ $\Delta R < 15\%$

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