

**PRODUCT  
DATASHEET**



**CLM3820 30A -AS Series Device**

## CLM3820 30A -AS Series Device

### Description

Current Limiting Module (CLM) is a chip type surface mountable device that can protect against both overcurrent and overcharging. It comprises a fuse element to ensure stable operation under normal electrical current and to cut off the current when overcurrent occurs. It also comprises a resistive heating element that could be used in combination with a voltage detecting means, such as IC and FET. When overvoltage is detected, the heating element is electrically excited to generate heat to blow the fuse element to achieve overvoltage protection.



### Features

- Halogen-free
- Surface mountable
- Overcharging protection
- Fast response time
- Overcurrent protection



### Application

- Self Balancing
- Automotive applications
- E-Bike
- Energy Storage systems
- Power Tool
- Drone

### Agency Approval and Environmental Compliance

Agency	File Number	Regulation	Standard
	E331807		IEC 61249-2-21:2003
	TA 50428400		

RoHS Directive: Compliance (This product complies with RoHS exemption requirements, since the high melting temperature solder and electronic ceramic parts include Lead.)

### Electrical Specifications

Part Number	I <sub>rated</sub> (A)	Cells in series	V <sub>max</sub> (V <sub>DC</sub> )	I <sub>break</sub> (A)	V <sub>OP</sub> (V)	Resistance		Agency Approval	
						R <sub>heater</sub> (Ω)	R <sub>fuse</sub> (mΩ)		
CLM3820P1230-AS	30	3	80	80	8.4 ~ 13.2	3.2 ~ 5.2	0.5 ~ 2.5	✓	✓
CLM3820P1430-AS	30	4	80	80	11.1 ~ 18.4	6.3 ~ 9.3	0.5 ~ 2.5	✓	✓
CLM3820P2030-AS	30	5	80	80	14.0 ~ 23.4	10.0 ~ 15.0	0.5 ~ 2.5	✓	✓
CLM3820P3030-AS	30	6~7	80	80	20.2 ~ 31.5	18.8 ~ 31.2	0.5 ~ 2.5	✓	✓
CLM3820P4030-AS	30	9~10	80	80	28.0 ~ 46.9	40.0 ~ 60.0	0.5 ~ 2.5	✓	✓
CLM3820P5050-AS	30	12~14	80	80	39.6 ~ 62.0	72.4 ~ 120.6	0.5 ~ 2.5	✓	✓



## CLM3820 30A -AS Series Device

### Electrical Characteristics

Current Capacity	100% x $I_{\text{rated}}$ No Melting
Cut Time	200% x $I_{\text{rated}}$ < 1 min
Interrupting Current	100A, power on 5 ms, power off 995 ms, 10000 cycles No Melting
Over Voltage Operation	In operation voltage range, the fusing time is <1min.

### Note on Electrical Specifications & Characteristics

#### ■ Vocabulary

$I_{\text{rated}}$  = Current carrying capacity that is measured at 40°C thermal equilibrium condition.  
 $I_{\text{break}}$  = The current that the fuse element is able to interrupt.  
 $V_{\text{max}}$  = The maximum voltage that can be cut off by fuse.  
 $V_{\text{op}}$  = Range of operation voltage.  
 $R_{\text{heater}}$  = The resistance of the heating element.  
 $R_{\text{fuse}}$  = The resistance of the fuse element.

Cells in series = Number of battery cells connected in series in the circuit for CLM device to protect.

- **Value specified is determined by using the PWB with 6mm\*2oz copper traces, AWG10 covered wire, and 0.6mm glass epoxy PCB.**
- **Specifications are subject to change without notice.**

## **WARNING**

#### ■ General

- Before and after mounted, the ultrasonic-cleaning or immersion-cleaning must not be done to CLM device. The flux on element would flow, and it would not be satisfied its specification when cleaning is done. In addition, a similar influence happens when the product comes in contact with cleaning-solution. These products after cleaning will not be guaranteed.
- Silicone-based oils, oils, solvents, gels, electrolytes, fuels, acids, and the like will adversely affect the properties of CLM devices, and shall not be used or applied.
- Please Do Not reuse the CLM device removed by the soldering process.
- CLM devices are secondary protection devices and are used solely for sporadic, accidental over-current or over-temperature error condition, and shall NOT be used if or when constant or repeated fault conditions (such fault conditions may be caused by, among others, incorrect pin-connection of a connector) or over-extensive trip events may occur.
- Operation over the maximum rating or other forms of improper use may cause failure, arcing, flame and/or other damage to the CLM devices.
- The performance of CLM devices will be adversely affected if they are improperly used under electronic, thermal and/or mechanical procedures and/or conditions non-conformant to those recommended by manufacturer.
- Customers shall be responsible for determining whether it is necessary to have back-up, failsafe and/or fool-proof protection to avoid or minimize damage that may result from extra-ordinary, irregular function or failure of CLM devices.
- There should be minimum of 0.1mm spacing between CLM and surrounding compounds, to maintain the product characteristics and avoid damage other surrounding compounds.
- This product is designed and manufactured only for general-use of electronics devices. We do not recommend that it is used for the applications Military, Medical and so on which may cause direct damages on life, bodies or properties.
- Please prevent to contact resin-mold with CLM devices, which might be infiltrated by resin material and lead to the specification incompatible. It will not be guaranteed after resin-mold has been done to product.



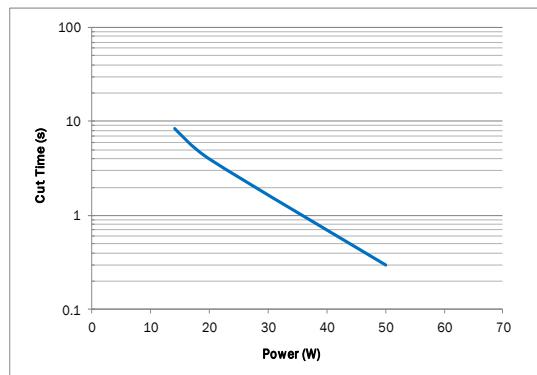
## CLM3820 30A -AS Series Device

### Thermal Derating Characteristics

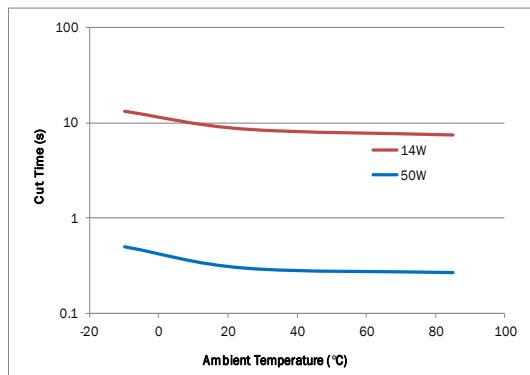
Ambient Temperature (°C)	25	40	60
Recommend Rated Current (A)	34.0	30.0	25.0

### Cut Time by Heater Operation

■ Various heater wattage at 25°C ambient temperature.

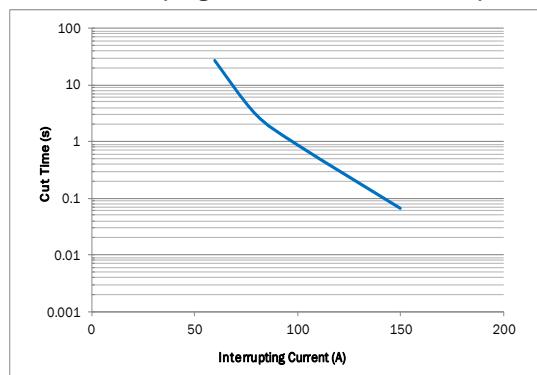


■ Constant heater wattage at various ambient temperature.

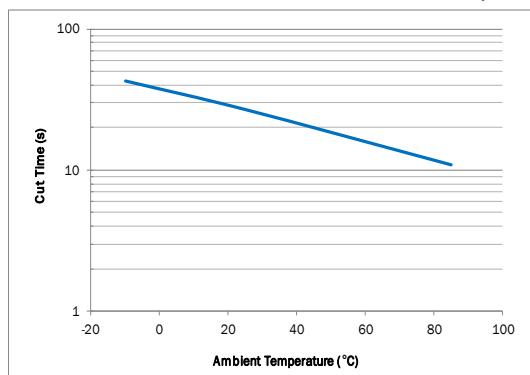


### Cut Time by Current Operation

■ Various interrupting current at 25°C ambient temperature.

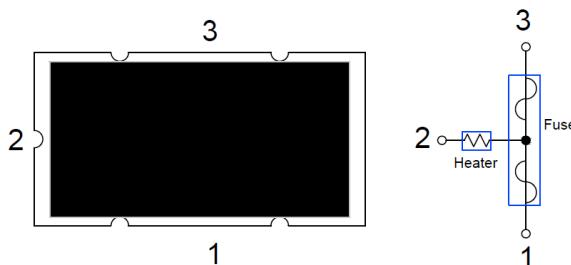


■ Constant 2x rated current at various ambient temperature.

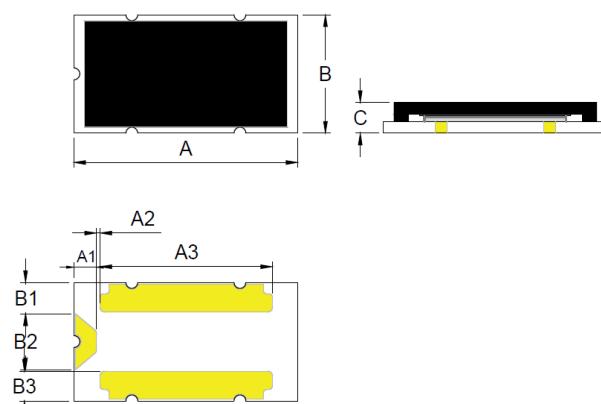


## CLM3820 30A -AS Series Device

### Device Circuit



### Physical Dimensions (mm.)



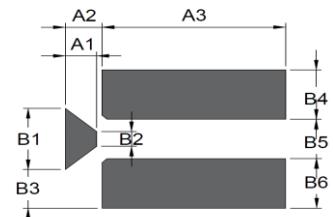
<b>A</b>	$9.50 \pm 0.2$
<b>B</b>	$5.00 \pm 0.3$
<b>C</b>	2.00 max
<b>A1</b>	$0.89 \pm 0.1$
<b>A2</b>	$0.15 \pm 0.1$
<b>A3</b>	$7.32 \pm 0.1$

<b>B1</b>	$1.32 \pm 0.1$
<b>B2</b>	$2.36 \pm 0.1$
<b>B3</b>	$1.25 \pm 0.1$

### Environmental Specifications

Storage Temperature	$0 \sim 35^\circ\text{C}$ , $\leq 70\%$ RH 3 months after shipment
Operating Temperature	$-10^\circ\text{C}$ to $+65^\circ\text{C}$
Hot Passive Aging	$100 \pm 5^\circ\text{C}$ , 250 hours No structural damage and functional failure
Humidity Aging	$60^\circ\text{C} \pm 2^\circ\text{C}$ , 90~95%R.H. 250 hours No structural damage and functional failure
Cold Passive Aging	$-20 \pm 3^\circ\text{C}$ , 500 hours No structural damage and functional failure
	MIL-STD-202 Method 107G
Thermal Shock	$+125^\circ\text{C} / -55^\circ\text{C}$ , 100 times No structural damage and functional failure

### Board and Solder Layout Recommend (mm)

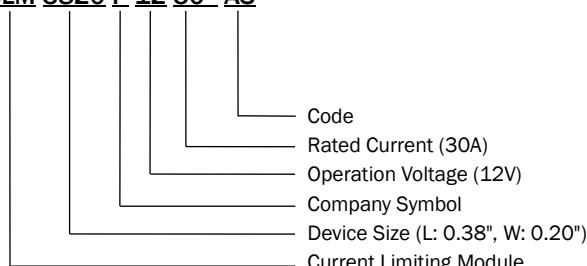


<b>Material</b>	Glass Epoxy PCB
<b>Base Thickness</b>	0.6mm
<b>Copper Thickness</b>	0.07mm
<b>Covered Wire</b>	AWG10

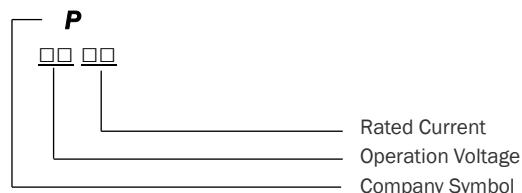
<b>A1</b>	$1.30 \pm 0.1$
<b>A2</b>	$1.52 \pm 0.1$
<b>A3</b>	$7.60 \pm 0.1$

<b>B1</b>	$3.10 \pm 0.1$
<b>B2</b>	$0.75 \pm 0.1$
<b>B3</b>	$1.95 \pm 0.1$
<b>B4</b>	$2.50 \pm 0.1$
<b>B5</b>	$2.00 \pm 0.1$
<b>B6</b>	$2.50 \pm 0.1$

### Part Number System

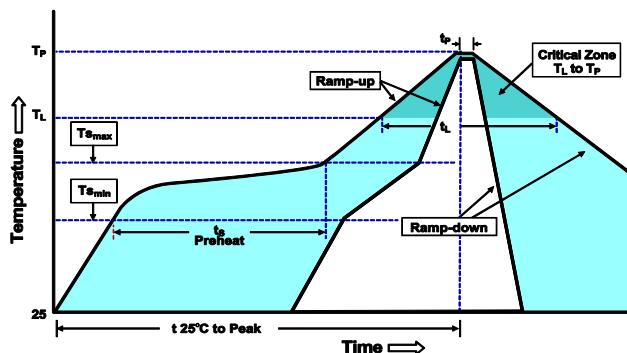
**CLM 3820 P 12 30 - AS**


### Part Marking System



## CLM3820 30A -AS Series Device

### Soldering Parameters



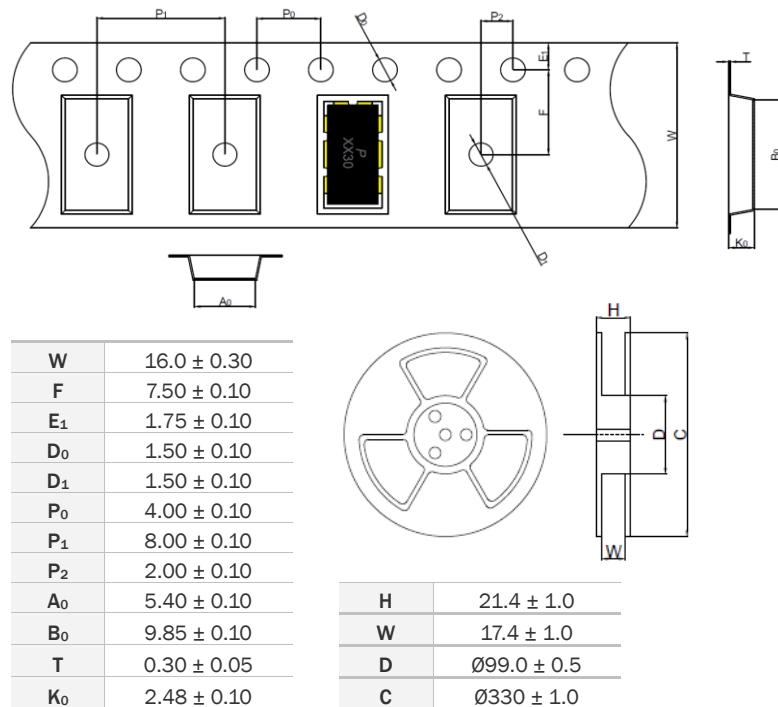
Average Ramp-Up Rate (T <sub>s</sub> max to T <sub>p</sub> )	3°C/second max.
Preheat	
-Temperature Min (T <sub>s</sub> min)	150°C
-Temperature Max (T <sub>s</sub> max)	200°C
-Time (T <sub>s</sub> min to T <sub>s</sub> max)	60-120 seconds
Time maintained above:	
-Temperature (T <sub>L</sub> )	217°C
-Time (t <sub>L</sub> )	60-105 seconds
Peak Temperature (T <sub>p</sub> )	255°C
Time within 5°C of actual Peak Temperature (t <sub>p</sub> )	5 seconds max.
Ramp-Down Rate	6°C /second max.
Time 25°C to Peak Temperature	8 minutes max.

Note 1: The temperature shown above is the top-side surface temperature of the device.

Note 2: If the soldering temperature profile deviates from the recommended profile, devices may not meet the performance requirements

### Tape & Reel Specification (mm.)

Devices are packaged per EIA481 and EIA-2 standard



### Packaging Quantity

Part Number	Tape & Reel Quantity
CLM3820PXX30-AS	1000

