Power Resistor, for Mounting onto a Heatsink Thick Film Technology

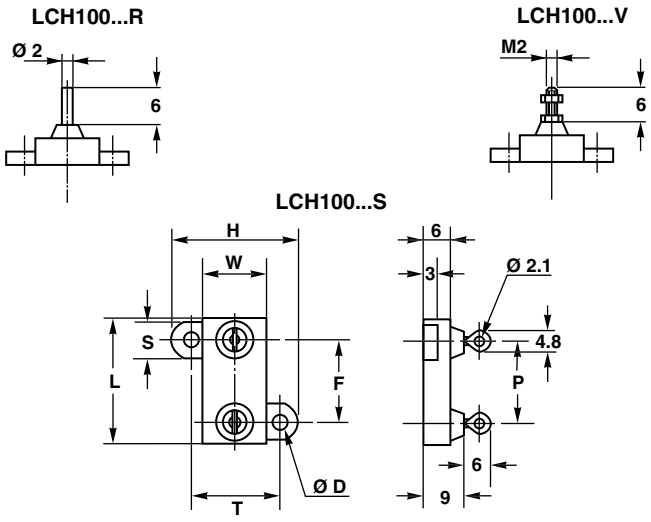


FEATURES

- 100 W at 25 °C case temperature
- High power rating
- High overload capabilities up to 2500 V_{RMS}
- Wide resistance range from 0.06 Ω to 1 MΩ
- High thermal capacity up to 1 °C/W
- Easy mounting
- Reduced size and weight
- High insulation: 10^6 MΩ
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

DIMENSIONS



MODEL	LCH 100
L	47.8
W	15.5
H	29.4
P Leads Pitch	30.5
F Connections Pitch	39.7
T	21.4
S	8
Ø D	3.2
V Leads	M2

Note

- General tolerance: ± 0.3 mm

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE	RESISTANCE RANGE Ω	RATED POWER (2) $P_{25\,°C}$ W	LIMITING ELEMENT VOLTAGE V	TOLERANCE ± %	TEMPERATURE COEFFICIENT ± ppm/°C	CRITICAL RESISTANCE Ω
LCH 100	100	0.06 to 1M (1)	100	1285	1, 2, 5, 10	150	16 512

Notes

(1) E24 series

(2) Chassis mounted

MECHANICAL SPECIFICATIONS

Flammability	Insulated case
Resistive Element	Cermet
Substrate	Alumina
Connections	Tinned copper alloy
Weight	12 g

ENVIRONMENTAL SPECIFICATIONS

Temperature Range	-55 °C to +125 °C
Climatic Category	55 / 125 / 56

TECHNICAL SPECIFICATIONS

Standard Resistance Tolerances	± 1 % to ± 10 % From 0.06 Ω to 1 MΩ only ± 5 % and ± 10 % available
Temperature Coefficient	± 150 ppm/°C (R > 1 Ω) -55 °C / +125 °C
Insulation Resistance	10^6 MΩ
Inductance	≤ 0.1 µH

For technical questions, contact: sferfixedresistors@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

PERFORMANCE		
TESTS	**CONDITIONS**	**REQUIREMENTS**
Momentary Overload	IEC 60115-1 2 Pr/5 s $U_S < 2\ U_L$	< ± (0.25 % + 0.05 Ω)
Rapid Temperature Change	IEC 60115-1 125 °C CEI 68215 Test Na 5 cycles -55 °C to +125 °C	< ± (0.25 % + 0.05 Ω)
Load Life	IEC 60115-1 90' on/30' off 1000 h Pr at + 25 °C	< ± (0.5 % + 0.05 Ω)
Humidity (Steady State)	IEC 60115-1 IEC 60068-2-3 Test Ca 56 days RH 95 % MIL-STD-202 Method 103 B and C	< ± (0.5 % + 0.05 Ω)

RESISTANCE VALUE IN RELATION TO TOLERANCE AND TCR		
Resistance Value	< 1 Ω	> 1 Ω
Standard Tolerances	± 5 % ± 10 %	
Standard TCR IEC 60115-1 -55 °C / +125 °C	± 450 ppm/°C	± 150 ppm/°C
Tolerance on Request	± 1 % to ± 2 % (only for R > 1 Ω to 1 MΩ)	

SPECIAL FEATURES	
MODEL	**LCH 100**
Power Rating Chassis Mounted	100 W (25 °C case temp.)
Thermal Resistance $R_{TH\ (j\ -\ c)}$	1 °C/W
Limiting Element Voltage (V_{RMS})	1285 V
Max. Overload Voltage (V_{RMS})	2500 V
Dielectric Strength (V_{RMS}) 50 Hz, 1 min MIL-STD-202 Method 301 10 mA Max.	3500 V
Critical Resistance	16 512 Ω

For technical questions, contact: sferfixedresistors@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

RECOMMENDATIONS FOR MOUNTING ONTO A HEATSINK

- Surfaces in contact must be carefully cleaned.
- The heatsink must have an acceptable flatness: from 0.05 mm to 0.1 mm/100 mm.
- Roughness of the heatsink must be around 6.3 µm. In order to improve thermal conductivity, surfaces in contact (alumina, heat-sink) are coated with a silicone grease (type SI 340 from Rhône-Poulenc or Dow 340 from Dow Corning).
- The fastening of the resistor to the heatsink is under pressure control of two screws (not supplied).

Tightening Torque on Heatsink	LCH 100
	1 Nm

- In order to improve the dissipation, either forced-air cooling or liquid cooling may be used.
- A low thermal radiation of the case allows several resistors to be mounted onto the same heatsink.
- Do not forget to respect an insulation value between two resistors (dielectric strength in dry air 1 kV/mm).
- In any case the hot spot temperature, measured locally on the case must not exceed 125 °C.
- Tests should be performed by the user.

CHOICE OF THE HEATSINK

The user must choose the heatsink according to working conditions of the component (power, room temperature). Maximum working temperature must not exceed 125 °C. The dissipated power is simply calculated by the following ratio:

$$P = \frac{\Delta T}{[R_{TH\ (j\ -\ c)} + R_{TH\ (c\ -\ a)}]} \quad (1)$$

P: Expressed in W

ΔT: Difference between maximum working temperature and room temperature.

$R_{TH\ (j\ -\ c)}$: Thermal resistance value measured between resistance layer and outer side of the resistor.
It is the thermal resistance of the component (See Special Features table).

$R_{TH\ (c-\ a)}$: Thermal resistance value measured between outer side of the resistor and room temperature.
It is the thermal resistance of the heatsink depending on the heatsink itself (type, shape) and the quality of the fastening device.

Example:

$R_{TH\ (c-\ a)}$: For LCH 100 power rating 20 W at ambient temperature +50 °C.

$\Delta T \leq 125\ °C - 50\ °C \leq 75\ °C$

$R_{TH\ (j\ -\ c)} = 1\ °C/W$ (Special Features)

$R_{TH\ (j\ -\ c)} + R_{TH\ (c\ -\ a)} = \frac{\Delta T}{P} = \frac{75}{20} = 3.75\ °C/W$

$R_{TH\ (c\ -\ a)} \leq 3.75\ °C/W - 1\ °C/W \leq 2.75\ °C/W$

For technical questions, contact: sferfixedresistors@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

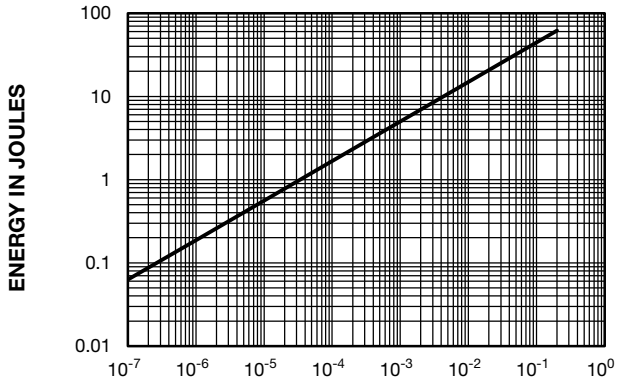
OVERLOADS

The applied voltage must always be lower than the maximum overload voltage as shown in the special features table.
The values indicated on the graph below are applicable to resistors in air or mounted onto a heatsink.

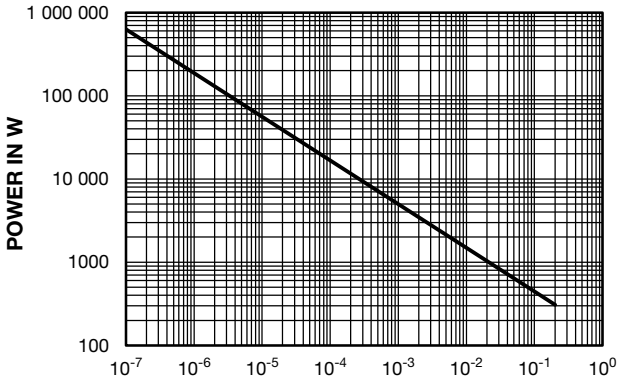
MARKING

Model, style, resistance value (in Ω), tolerance (in %), manufacturing date, Vishay Sfernice trademark.

ENERGY CURVE

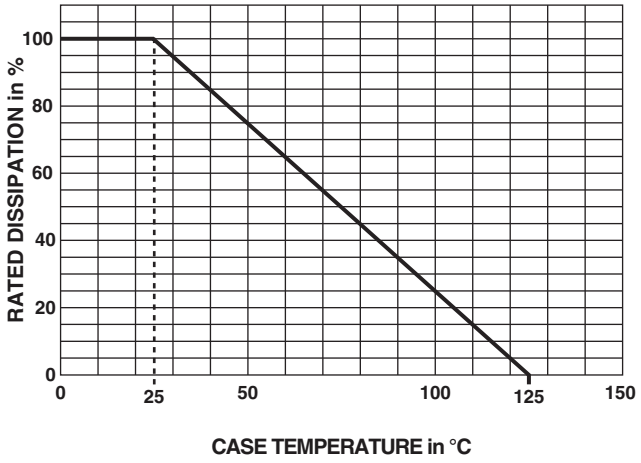


POWER CURVE



POWER RATING

For resistors mounted onto heatsink and thermal resistance of 1 °C/W.
To improve the thermal conductivity, surfaces in contact should be coated with a silicone grease.



For technical questions, contact: sferfixedresistors@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

ORDERING INFORMATION

LCH	100	3.3 kΩ	± 5 %	R	XXX
MODEL	STYLE	RESISTANCE VALUE	TOLERANCE	CONNECTIONS	CUSTOM DESIGN
			Optional ± 1 % ± 2 % ± 5 % ± 10 %	Optional S: Flat with hole R: Round lead V: M2 screw	Optional

GLOBAL PART NUMBER INFORMATION

L	C	H	1	0	0	R	4	8	7	0	1	J	S	0	6	

GLOBAL MODEL	SIZE	LEADS	OHMIC VALUE	TOLERANCE	PACKAGING	SPECIAL
LCH	**100**	**R** = round lead **V** = M2 screw **S** = flat with hole	The first four digits are significant figures and the last digit specifies the number of zeros to follow. R designates decimal point. **4R700** = 4.7 Ω **48701** = 48 700 Ω **R0100** = 0.01 Ω **R6800** = 0.68 Ω **27000** = 2700 Ω = 2.7 kΩ	**F** = 1 % **G** = 2 % **J** = 5 % **K** = 10 %	**S06** = bag 25 pieces	As applicable Ex = **XXX**

For technical questions, contact: sferfixedresistors@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

© 2022 VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED