2 Terminals Current Sense
Surface Mount Metal Strip Power Resistors

FEATURES

- Temperature coefficient of resistance to ±50 ppm/°C max. (+20°C to +120°C)
- Power rating: to 12 W
- Resistance tolerance: to ±1%
- Resistance range: 0.2mΩ to 4 mΩ
- Short time overload: ±0.5%
- Maximum current: up to 244 A
- Low Inductance <3nH
- **AEC-Q200 qualified**
- Proprietary processing techniques produce low resistance values and improved TCR
- Working Temperature -65°C to +170°C
- Solderable terminations
- Quick prototype quantities available, please contact: foil@vpgsensors.com

Pb-free Available

RoHS* COMPLIANT

KEY APPLICATIONS

Applications requiring accuracy and repeatability under stress conditions such as the following:

- Switching and linear power supplies
- Precision current-sensing
- Power management systems
- Feedback circuits
- Power amplifiers
- Measurement instrumentation
- Precision instrumentation amplifiers
- Medical and automatic test equipment
- Frequency converters
- Communication systems
- High current applications for the automotive market

Figure 1 – Power Derating Curve

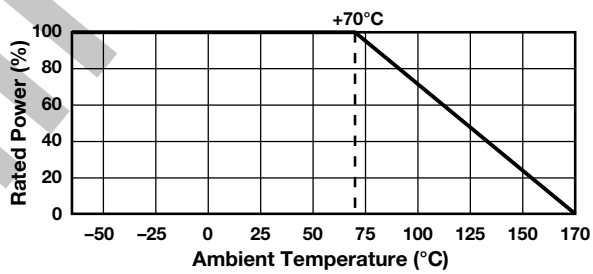


Table 1 – Specifications

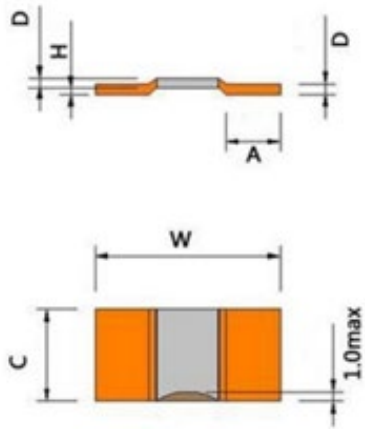
PARAMETER	CSM3920A
Resistance Range	0.2 mΩ to 4 mΩ
Power Rating at 70°C	12 W (0.2 mΩ) 10 W (0.3 mΩ) 9 W (0.5 mΩ) 8 W (1 mΩ) 6 W (2 mΩ) 5 W (3 - 4 mΩ)
Maximum Current(1)	244 A
Tolerance	to ±1%
Temperature Coefficient Max. (+20°C to +125°C)	±200 ppm/C, (0.2 mΩ) ±150 ppm/C, (0.3 mΩ) ±70 ppm/C, (0.5 mΩ) ±50 ppm/C, (1 - 4 mΩ)
Operating Temperature Range	–65°C to +170°C
Maximum Working Voltage	$(P \times R)^{1/2}$

Notes

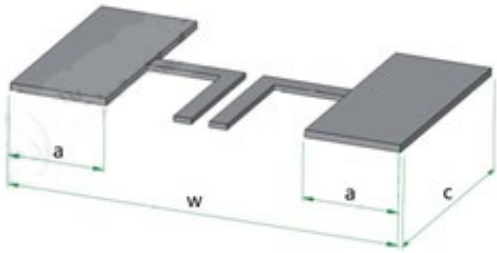
(1) Maximum current for a given resistance value is calculated using $I = \sqrt{P/R}$

Figure 2 – Mechanical Dimensions in millimeters

CSM3920A DIMENSIONS



CSM3920A LAND PATTERN



Dimensions in millimeters

MODEL	RESISTANCE RANGE (mΩ)	W	A	C	H	D
CSM3920A	0.2	10 ± 0.2	2.2 ± 0.2	5.1 ± 0.4	0.5 ± 0.1	1.64 ± 0.1
	0.3	10 ± 0.2	2.2 ± 0.2	5.1 ± 0.4	0.5 ± 0.1	1.37 ± 0.1
	0.5	10 ± 0.2	2.2 ± 0.2	5.1 ± 0.4	0.5 ± 0.1	0.83 ± 0.1
	1 (Mng)	10 ± 0.2	2.2 ± 0.2	5.1 ± 0.4	0.5 ± 0.1	0.40 ± 0.1
	1 (NiCr)	10 ± 0.2	2.2 ± 0.2	5.1 ± 0.4	0.5 ± 0.1	1.16 ± 0.1
	2	10 ± 0.2	2.2 ± 0.2	5.1 ± 0.4	0.5 ± 0.1	0.56 ± 0.1
	3	10 ± 0.2	2.2 ± 0.2	5.1 ± 0.4	0.5 ± 0.1	0.37 ± 0.1
	4	10 ± 0.2	2.2 ± 0.2	5.1 ± 0.4	0.5 ± 0.1	0.28 ± 0.1

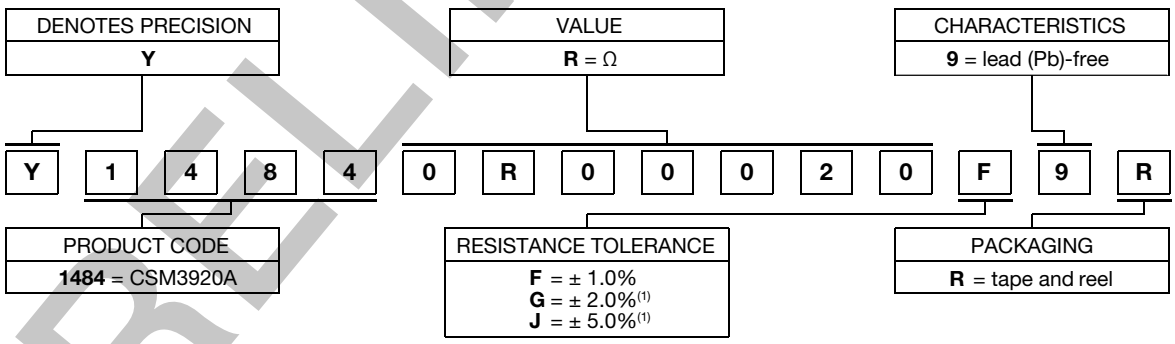
Land Pattern Dimensions in millimeters

MODEL	RESISTANCE RANGE (mΩ)	a	c	w
CSM3920A	0.2 to 4	2.7	6.2	11

Table 2 – CSM3920Y Performance Specifications			
TEST	**CONDITIONS**	**MIL Reference**	**ΔR LIMITS**
Temperature Cycling	1000 Cycles(-55°C to +125°C)	JESD22 Method JA-104	±0.5%
High Temperature Exposure	100hrs.@T=170°C.Unpowered.	MIL-STD-202 Method 108	±0.5%
Moisture Resistance	t=24hrs/cycle.Note:Steps 7a & 7b not required. Unpowered.	MIL-STD-202 Method 106	±0.5%
Biased Humidity	1000hrs 85°C/85%RH. Note:Specified conditions:10% of operating power.	MIL-STD-202 Method 103	±0.5%
Operational Life	Condition D Steady State TA=125°C at rated power.	MIL-STD-202 Method 108	±0.5%
Solderability	245°C±5°C,5s+0.5s/-0	J-STD-002C	95% Coverage Minimum
Vibration	5 g's for 20 min, 12 cycles each of 3 orientations. Note: Use 8"X5" PCB .031" thick 7 secure points on one long side and 2 secure points at corners of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz.	MIL-STD-202 Method 204	±0.5%
Resistance to Soldering Heat	260°C±5°C, 10s±1s	MIL-STD-202 Method 210	±0.5%
Short Time Overload	5×Rated power for 5 s	MIL-STD-202 Method 301	±0.5%

Figure 3 – Global Partnumber Information

GLOBAL PART NUMBER: Y14840R00020F9R



FOR EXAMPLE: ABOVE GLOBAL ORDER Y1484 0R00020 F 9 R:
TYPE: CSM3920A
VALUE: 0.2 mΩ
ABSOLUTE TOLERANCE: ± 1.0%
TERMINATION: lead (Pb)-free
PACKAGING: tape and reel

Note
(1) Please contact foil@vpgsensors.com

Disclaimer

ALL PRODUCTS, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE.

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

The product specifications do not expand or otherwise modify VPG’s terms and conditions of purchase, including but not limited to, the warranty expressed therein.

VPG makes no warranty, representation or guarantee other than as set forth in the terms and conditions of purchase. **To the maximum extent permitted by applicable law, VPG 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.**

Information provided in datasheets and/or specifications may vary from actual results in different applications and performance may vary over time. Statements regarding the suitability of products for certain types of applications are based on VPG’s knowledge of typical requirements that are often placed on VPG products. 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. You should ensure you have the current version of the relevant information by contacting VPG prior to performing installation or use of the product, such as on our website at vpgsensors.com.

No license, express, implied, or otherwise, to any intellectual property rights is granted by this document, or by any conduct of VPG.

The products shown herein are not designed for use in life-saving or life-sustaining applications unless otherwise expressly indicated. Customers using or selling VPG products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify VPG for any damages arising or resulting from such use or sale. Please contact authorized VPG personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.