

2 Terminals Current Sense Surface Mount Metal Strip Power Resistors

FEATURES

- Temperature coefficient of resistance to ± 70 ppm/ $^{\circ}\text{C}$ max. (+20 $^{\circ}\text{C}$ to +120 $^{\circ}\text{C}$)
- Power rating: to 6 W
- Resistance tolerance: to $\pm 1\%$
- Resistance range: 0.2 m Ω to 5 m Ω
- Short time overload: $\pm 0.5\%$
- Maximum current: up to 173 A
- Low Inductance <3nH
- **AEC-Q200 qualified**
- Proprietary processing techniques produce low resistance values and improved TCR
- Working Temperature -65 $^{\circ}\text{C}$ to +170 $^{\circ}\text{C}$
- Solderable terminations
- Quick prototype quantities available, please contact: foil@vpgsensors.com

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



RoHS*
COMPLIANT

Figure 1 – Power Derating Curve

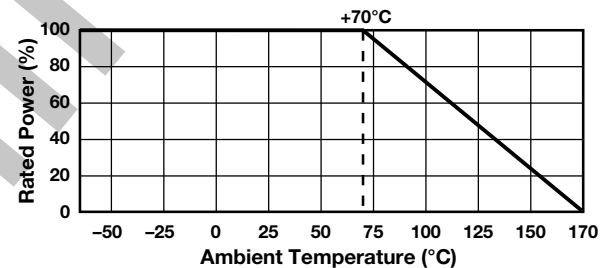


Table 1 – Specifications

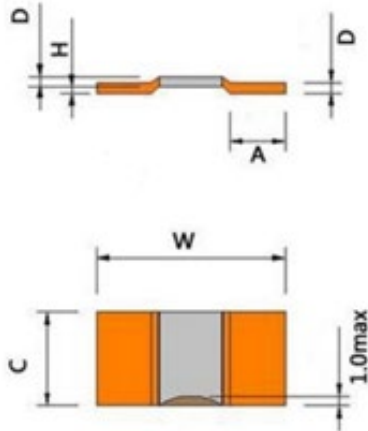
PARAMETER	CSM2512A
Resistance Range	0.2 m Ω to 5 m Ω
Power Rating at 70 $^{\circ}\text{C}$	6 W (0.2 - 0.5 m Ω) 5 W (1 - 2 m Ω) 4 W (3 m Ω) 3 W (4 - 5 m Ω)
Maximum Current ⁽¹⁾	173 A
Tolerance	to $\pm 1\%$
Temperature Coefficient Max. (+20 $^{\circ}\text{C}$ to +120 $^{\circ}\text{C}$)	± 175 ppm/ $^{\circ}\text{C}$, (0.2 - 0.3 m Ω) ± 115 ppm/ $^{\circ}\text{C}$, (0.5 m Ω) ± 100 ppm/ $^{\circ}\text{C}$, (1 m Ω) ± 70 ppm/ $^{\circ}\text{C}$, (2 - 5 m Ω)
Operating Temperature Range	-65 $^{\circ}\text{C}$ to +170 $^{\circ}\text{C}$
Maximum Working Voltage	$(P \times R)^{1/2}$

Notes

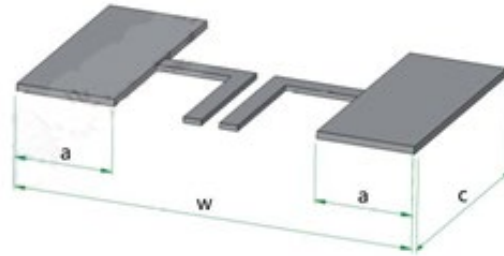
⁽¹⁾ Maximum current for a given resistance value is calculated using $I = \sqrt{P/R}$

Figure 2 – Mechanical Dimensions in millimeters

CSM2512A DIMENSIONS



CSM2512A LAND PATTERN



Dimensions in millimeters

MODEL	RESISTANCE RANGE (mΩ)	W	A	C	H	D
CSM2512A	0.2	6.3 ± 0.2	1.2 ± 0.2	3.1 ± 0.4	0.5 ± 0.1	1.4 ± 0.1
	0.3	6.3 ± 0.2	1.2 ± 0.2	3.1 ± 0.4	0.5 ± 0.1	1.5 ± 0.1
	0.5	6.3 ± 0.2	1.2 ± 0.2	3.1 ± 0.4	0.5 ± 0.1	0.93 ± 0.1
	1	6.3 ± 0.2	1.2 ± 0.2	3.1 ± 0.4	0.5 ± 0.1	0.45 ± 0.1
	2	6.3 ± 0.2	1.2 ± 0.2	3.1 ± 0.4	0.5 ± 0.1	0.65 ± 0.1
	3	6.3 ± 0.2	1.2 ± 0.2	3.1 ± 0.4	0.5 ± 0.1	0.43 ± 0.1
	4	6.3 ± 0.2	1.2 ± 0.2	3.1 ± 0.4	0.5 ± 0.1	0.31 ± 0.1
5	6.3 ± 0.2	1.2 ± 0.2	3.1 ± 0.4	0.5 ± 0.1	0.28 ± 0.1	

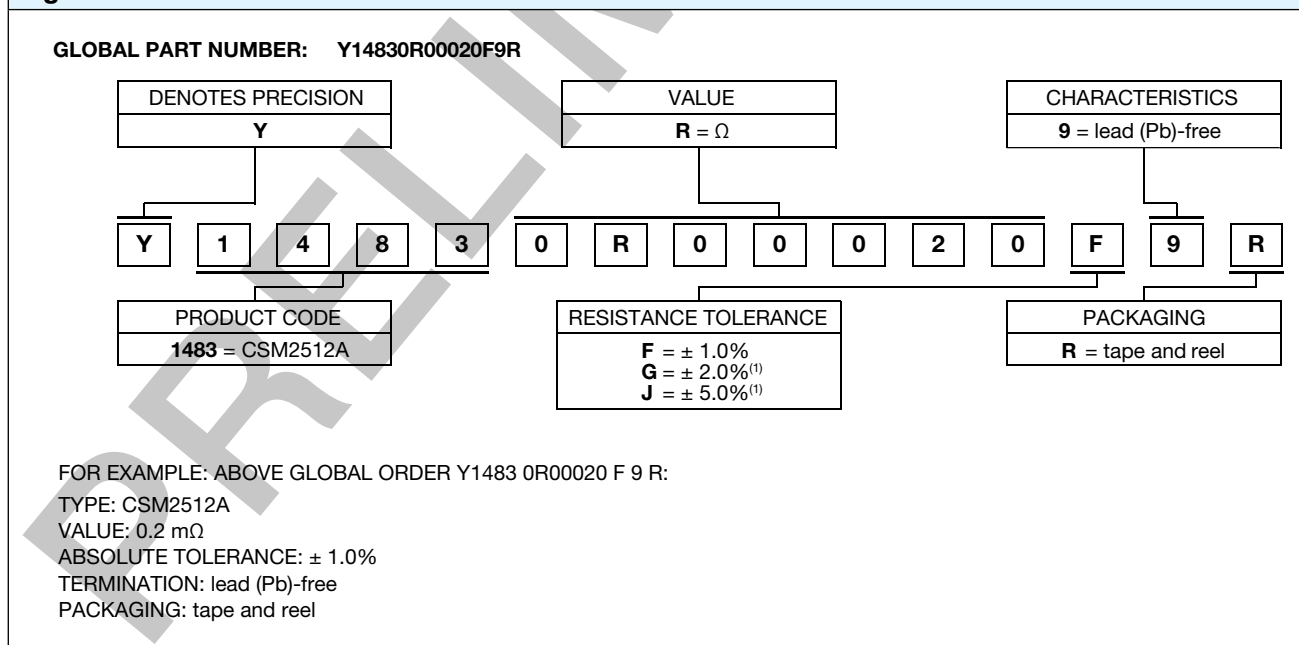
Land Pattern Dimensions in millimeters

MODEL	RESISTANCE RANGE (mΩ)	a	c	w
CSM2512A	0.2 to 5	1.8	3.4	7

Table 2 – CSM2512Y 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



Note

⁽¹⁾ Please contact foil@vpgsensors.com