

Two-Terminal Surface Mount Resistor

AEC-Q200 Qualified > WPB/C-A Series

HF **RoHS** **Pb**


Description

Littelfuse WPB/C-A Series is low Ohm current sense resistor, designed with long stability, durability, excels at heat dissipation. It is a metal plate construction with low profile.

Features

- Power rating up to 3 W
- Tolerance down to $\pm 0.5\%$
- AEC-Q200 qualified

Benefits

- Small size

Web Resources



Download ECAD models, order samples, and find technical resources at www.littelfuse.com

Application

- Power management
- Low ESL
- Automotive

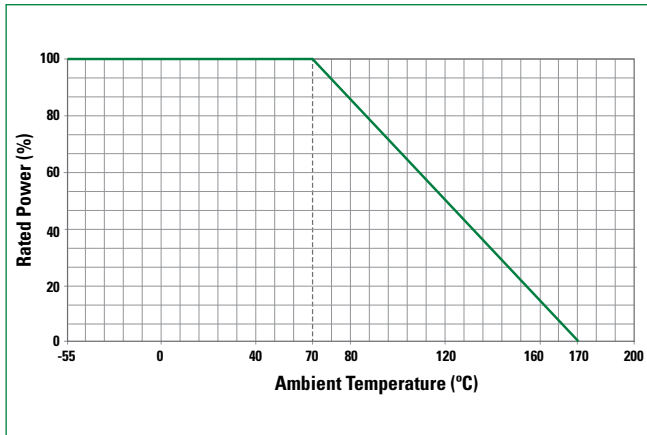
Electrical Specifications

LF Seires	LF PN	Size		Resistance		Power Rating (Watt)	TCR (ppm / °C)	Standard Package Qty
			mm	Ro (mΩ)	Rt (%)			
WPB	WPB2512RLR001FYR-A	2512	6432	1	$\pm 1.0\%$	2	± 100	4000
WPB	WPB2512QLR002FYR-A	2512	6432	2	$\pm 1.0\%$	2	± 50	4000
WPB	WPB2512QLR003FYR-A	2512	6432	3	$\pm 1.0\%$	2	± 50	4000
WPB	WPB2512QLR004FYR-A	2512	6432	4	$\pm 1.0\%$	2	± 50	4000
WPB	WPB2512QLR005FYR-A	2512	6432	5	$\pm 1.0\%$	2	± 50	4000
WPB	WPB2512QLR006FYR-A	2512	6432	6	$\pm 1.0\%$	2	± 50	4000
WPB	WPB2512QLR007FYR-A	2512	6432	7	$\pm 1.0\%$	2	± 50	4000
WPB	WPB2512QLR008FYR-A	2512	6432	8	$\pm 1.0\%$	2	± 50	4000
WPB	WPB2512QLR009FYR-A	2512	6432	9	$\pm 1.0\%$	2	± 50	4000
WPB	WPB2512QLR010FYR-A	2512	6432	10	$\pm 1.0\%$	2	± 50	4000
WPC	WPC2512RLR001FYR-A	2512	6432	1	$\pm 1.0\%$	3	± 100	4000
WPC	WPC2512QLR002FYR-A	2512	6432	2	$\pm 1.0\%$	3	± 50	4000
WPC	WPC2512QLR003FYR-A	2512	6432	3	$\pm 1.0\%$	3	± 50	4000
WPC	WPC2512QLR004FYR-A	2512	6432	4	$\pm 1.0\%$	3	± 50	4000
WPC	WPC2512QLR005FYR-A	2512	6432	5	$\pm 1.0\%$	3	± 50	4000
WPC	WPC2512QLR006FYR-A	2512	6432	6	$\pm 1.0\%$	3	± 50	4000
WPC	WPC2512QLR007FYR-A	2512	6432	7	$\pm 1.0\%$	3	± 50	4000
WPC	WPC2512QLR008FYR-A	2512	6432	8	$\pm 1.0\%$	3	± 50	4000
WPC	WPC2512QLR009FYR-A	2512	6432	9	$\pm 1.0\%$	3	± 50	4000
WPC	WPC2512QLR010FYR-A	2512	6432	10	$\pm 1.0\%$	3	± 50	4000

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Temperature De-rating Curve



Storage / Environment Conditions

Products should be stored under the following environmental conditions.

Temperature: +5 to +35 °C

Humidity: 45 to 85% relative humidity

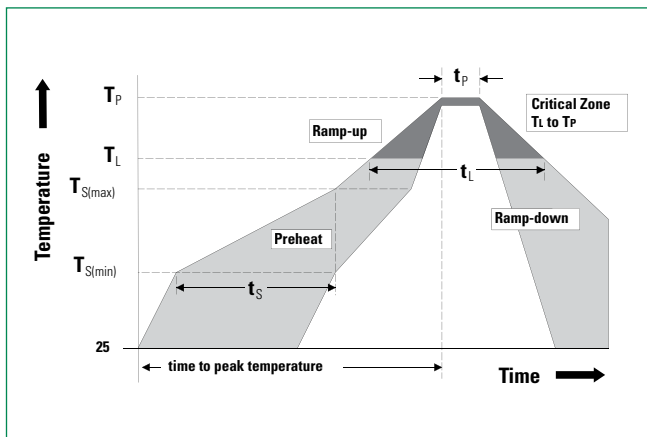
Moisture Sensitivity Level: 1, J-STD-020

Do not keep products in environments where they may be subject to particulate contamination or harmful gases such as sulfuric acid or hydrogen chloride as it may cause oxidation on electrodes, resulting poor solderability.

Products should be stored in a space that does not expose to high temperatures, vibration, or direct sunlight.

Products should be stored in the original airtight packaging until use.

Soldering Parameters–Wave Soldering



Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate ($T_{S(max)}$ to T_P)	3 °C / second max
Preheat	
Temperature Minimum ($T_{S(min)}$)	150 °C
Temperature Maximum ($T_{S(max)}$)	200 °C
Time ($T_{S(min)}$ to $T_{S(max)}$)	60–180 seconds
Time maintained above	
Temperature Minimum (T_L)	217 °C
Time (t_L)	60–150 seconds
Peak Temperature (T_P)	260 ± 0 °C
Time within 5 °C of Actual Peak Temperature (t_p)	20–40 seconds
Ramp-Down Rate	6 °C / second Maximum
Time 25 °C to Peak Temperature	8 minutes Maximum

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AEC-Q200 Reliability Specifications

Test	Procedure	Specifications
High Temp. Exposure (Storage) MIL-STD-202, Method 108	Test Temp 170 °C Test Period: 1,000 hours No Electrical Load	±1.0%
Temp. Cycling (Thermal Shock) JESD22 Method JA-104	Repeat 1,000 cycles as follows: -55 +/-3 °C for 30 minutes 155 +/-3 °C for 30 minutes Transition time of 1 minute max	±1.0%
Biased Humidity MIL-STD-202, Method 103	Test conditions: 85 °C and 85% RH 10% of rated power Test Period 1,000 hours	±1.0%
Load Life (Operational Life) MIL-STD-202, Method 108	Test Temperature: 125 +/- 3 °C Applied voltage: rated power (derated Power will be required if temp exceeds the derating point of part) Test Period: 1,000 hours (condition D)	±1.0%
Resistance to Solvents MIL-STD-202, Method 215	3 minute soak, 2–3 ounce force, 10 strokes / repetition, 3 repetitions	No damage
Mechanical Shock MIL-STD-202, Method 213	Force: 100 G peak. Test duration: 6 ms, Half-sine waveform, Velocity: 12.3 ft / sec	±1.0%
Vibration MIL-STD-202, Method 204	Frequency: 10–2,000 Hz Acceleration: 5G Test duration: 20 minutes, 12 cycles	±1.0%
Resistance to Soldering Heat MIL-STD-202, Method 210	Condition B (Solder dip, no pre-heat) 260 °C	±1.0%
ESD AEC-Q200-002	HBM, 100 pF, 1.5 kΩ. Repetition: 5 times	±1.0%
Solderability J-STD-002	Non-activated flux dip: 5-10 seconds. SAC solder dip: 2 ± 0.5 seconds at 245 °C	95% coverage
Flammability UL-94	V-0 or V-1 are acceptable. Electrical test not required	Provide certificate
Board Flex AEC-Q200-005	90 mm span between fulcrums, 2 mm bend. 60 seconds minimum holding time	±1.0%
Terminal Strength (SMD) AEC-Q200-006	Force of 17.7 N 60 seconds	±1.0%
Flame Retardance AEC-Q200-001	Mounted parts subjected to voltages from 9.0 to 32 VDC (current clamped up to 500 A) in 1.0 VDC increments. Voltage applied for 1 hour minimum or until failure occurs	Must meet AEC-Q200 requirements

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Dimensions

All dimensions in mm

Diagram: A

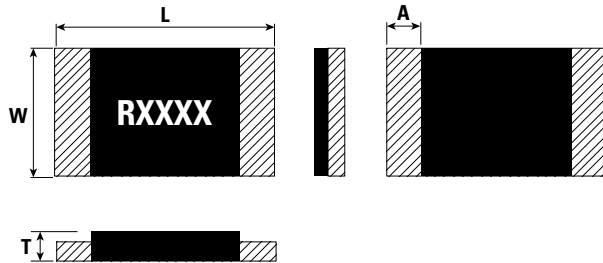
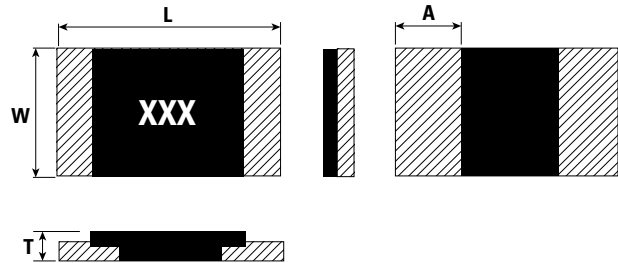
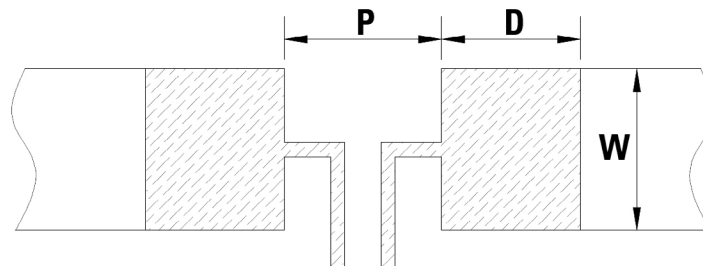


Diagram: B



Part Number	W	L	T	A	Diagram
WPB2512-A R001~R004	3.20±0.30	6.40±0.30	0.90±0.20	1.90±0.25	B
WPB2512-A R005~R010	3.20±0.30	6.40±0.30	0.90±0.20	0.80±0.25	A
WPC2512-A R001~R004	3.20±0.30	6.40±0.30	0.90±0.20	1.90±0.25	B
WPC2512-A R005~R010	3.20±0.30	6.40±0.30	0.90±0.20	0.80±0.25	A

Recommended Land Pattern



Part Number	P	W	D	Loading
WPB2512 -A R001~R004	1.50 mm	3.57 mm	2.95 mm	2.0 W
WPB2512 -A R005~R010	3.18 mm	3.57 mm	2.11 mm	2.0 W
WPC2512 -A R001~R004	1.50 mm	3.57 mm	2.95 mm	3.0 W
WPC2512 -A R005~R010	3.18 mm	3.57 mm	2.11 mm	3.0 W

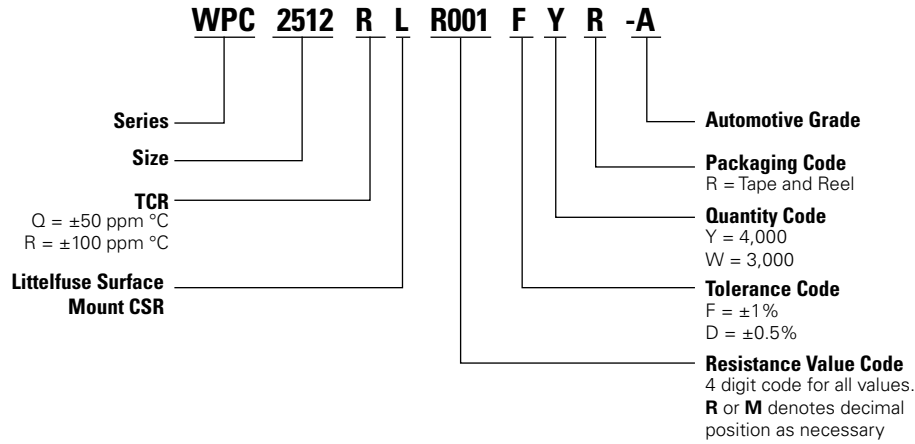
Packaging

Part Number	Halogen Free	Packaging Option	Quantity	Quantity & Packaging Codes
WPB2512 -A R001~R010	Yes	Tape and Reel	4000	YR
WPC2512 -A R001~R010	Yes	Tape and Reel	4000	YR

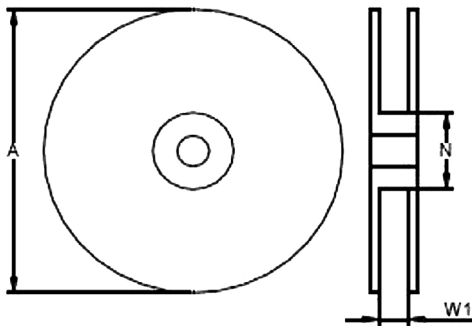
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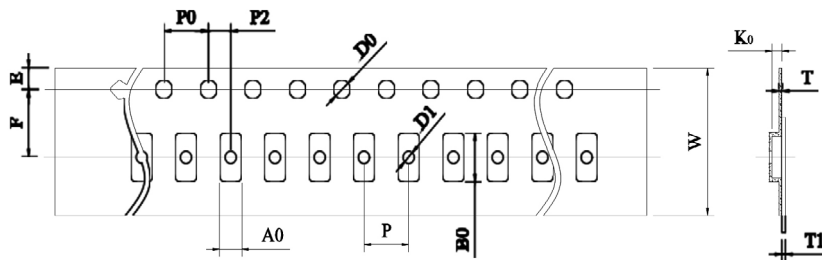
Part Numbering System



Tape and Reel Specifications



Part Number	A ± 5 (mm)	N ± 2 (mm)	W1 ± 1 (mm)
WPB2512-A	178	60	13
WPC2512-A	178	60	13



Part Number	W	P0	P	P2	A0	B0	D0	F	E	T	T1	K0
WPB2512-A	12.00 ± 0.30	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	3.40 ± 0.20	6.75 ± 0.20	1.55 ± 0.10	5.50 ± 0.10	1.75 ± 0.10	0.20 ± 0.10	Max. 0.1	1.00 ± 0.20
WPC2512-A	12.00 ± 0.30	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	3.40 ± 0.20	6.75 ± 0.20	1.55 ± 0.10	5.50 ± 0.10	1.75 ± 0.10	0.20 ± 0.10	Max. 0.1	1.30 ± 0.20

Note - Tape and reel packaging according to EIA-481.

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