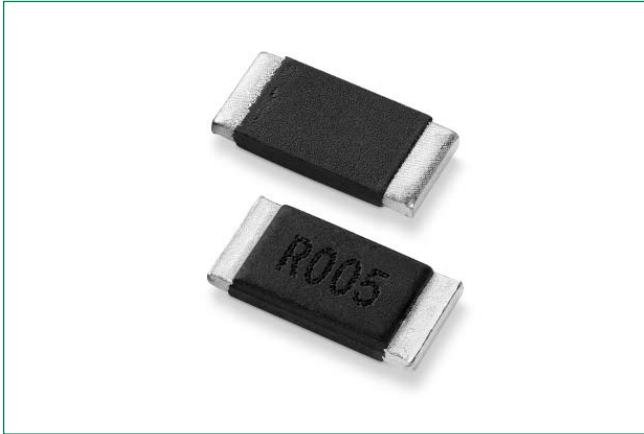


# Two-Terminal Surface Mount Resistor

## WPA/B/C Series

**HF** **RoHS** **Pb**


### Description

Littelfuse WPA/B/C 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 & Benefits

- Power rating up to 3 W
- Tolerance down to  $\pm 0.5\%$
- Small size
- High voltage

### Application

- Power management
- Low ESL

### Additional Information



Resources



Accessories



Samples

# Two-Terminal Surface Mount Resistor

## WPA/B/C Series

### Electrical Specifications

Littelfuse Series	Part Number	Size		Resistance Value		Power Rating (Watt)	TCR (ppm / °C)	Standard Package Quantity
		Inch	mm	Ro (mΩ)	Rt (%)			
WPA	WPA1206GLR001FYR	1206	3216	1	±1.0%	1,0	±150	4000
WPA	WPA1206GLR002FYR	1206	3216	2	±1.0%	1,0	±150	4000
WPA	WPA1206GLR003FYR	1206	3216	3	±1.0%	1,0	±150	4000
WPA	WPA1206DLR004FYR	1206	3216	4	±1.0%	1,0	±75	4000
WPA	WPA1206DLR005FYR	1206	3216	5	±1.0%	1,0	±75	4000
WPA	WPA1206DLR005DYR	1206	3216	5	±0.5%	1,0	±75	4000
WPA	WPA1206DLR006FYR	1206	3216	6	±1.0%	1,0	±75	4000
WPA	WPA1206DLR007FYR	1206	3216	7	±1.0%	1,0	±75	4000
WPA	WPA1206DLR008FYR	1206	3216	8	±1.0%	1,0	±75	4000
WPA	WPA1206DLR009FYR	1206	3216	9	±1.0%	1,0	±75	4000
WPA	WPA1206DLR010FYR	1206	3216	10	±1.0%	1,0	±75	4000
WPA	WPA1206DLR011FYR	1206	3216	11	±1.0%	1,0	±75	4000
WPA	WPA1206DLR012FYR	1206	3216	12	±1.0%	1,0	±75	4000
WPA	WPA1206DLR013FYR	1206	3216	13	±1.0%	1,0	±75	4000
WPA	WPA1206DLR014FYR	1206	3216	14	±1.0%	1,0	±75	4000
WPA	WPA1206DLR015FYR	1206	3216	15	±1.0%	1,0	±75	4000
WPB	WPB2512GL0M50FWR	2512	6432	0.5	±1.0%	2	±150	3000
WPB	WPB2512GL0M75FWR	2512	6432	0.75	±1.0%	2	±150	3000
WPB	WPB2512RLR001FYR	2512	6432	1	±1.0%	2	±100	4000
WPB	WPB2512RL1M50FYR	2512	6432	1.5	±1.0%	2	±100	4000
WPB	WPB2512QLR002FYR	2512	6432	2	±1.0%	2	±50	4000
WPB	WPB2512QLR003FYR	2512	6432	3	±1.0%	2	±50	4000
WPB	WPB2512QLR004FYR	2512	6432	4	±1.0%	2	±50	4000
WPB	WPB2512QLR005FYR	2512	6432	5	±1.0%	2	±50	4000
WPB	WPB2512QLR006FYR	2512	6432	6	±1.0%	2	±50	4000
WPB	WPB2512QLR007FYR	2512	6432	7	±1.0%	2	±50	4000
WPB	WPB2512QLR008FYR	2512	6432	8	±1.0%	2	±50	4000
WPB	WPB2512QLR009FYR	2512	6432	9	±1.0%	2	±50	4000
WPB	WPB2512QLR010FYR	2512	6432	10	±1.0%	2	±50	4000
WPB	WPB2512QLR011FYR	2512	6432	11	±1.0%	2	±50	4000
WPB	WPB2512QLR012FYR	2512	6432	12	±1.0%	2	±50	4000
WPB	WPB2512QLR013FYR	2512	6432	13	±1.0%	2	±50	4000
WPB	WPB2512QLR014FYR	2512	6432	14	±1.0%	2	±50	4000
WPB	WPB2512QLR015FYR	2512	6432	15	±1.0%	2	±50	4000
WPB	WPB2512QLR016FYR	2512	6432	16	±1.0%	2	±50	4000
WPB	WPB2512QLR018FYR	2512	6432	18	±1.0%	2	±50	4000
WPB	WPB2512QLR020FYR	2512	6432	20	±1.0%	2	±50	4000
WPB	WPB2512QLR021FYR	2512	6432	21	±1.0%	2	±50	4000
WPB	WPB2512QLR022FYR	2512	6432	22	±1.0%	2	±50	4000
WPB	WPB2512QLR024FYR	2512	6432	24	±1.0%	2	±50	4000
WPB	WPB2512QLR027FYR	2512	6432	27	±1.0%	2	±50	4000
WPB	WPB2512QLR028FYR	2512	6432	28	±1.0%	2	±50	4000
WPB	WPB2512QLR030FYR	2512	6432	30	±1.0%	2	±50	4000
WPB	WPB2512QLR033FYR	2512	6432	33	±1.0%	2	±50	4000
WPB	WPB2512QLR034FYR	2512	6432	34	±1.0%	2	±50	4000
WPB	WPB2512QLR036FYR	2512	6432	36	±1.0%	2	±50	4000
WPB	WPB2512QLR039FYR	2512	6432	39	±1.0%	2	±50	4000
WPB	WPB2512QLR043FYR	2512	6432	43	±1.0%	2	±50	4000
WPB	WPB2512QLR047FYR	2512	6432	47	±1.0%	2	±50	4000
WPB	WPB2512QLR050FYR	2512	6432	50	±1.0%	2	±50	4000
WPB	WPB2512QLR051FYR	2512	6432	51	±1.0%	2	±50	4000
WPB	WPB2512QLR056FYR	2512	6432	56	±1.0%	2	±50	4000

# Two-Terminal Surface Mount Resistor

## WPA/B/C Series

### Electrical Specifications

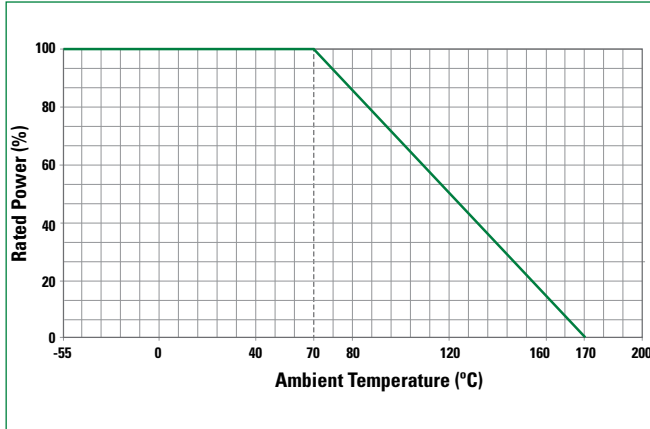
Littelfuse Series	Part Number	Size		Resistance Value		Power Rating (Watt)	TCR (ppm / °C)	Standard Package Quantity
		Inch	mm	Ro (mΩ)	Rt (%)			
WPC	WPC2512GL0M50FWR	2512	6432	0.5	±1.0%	3	±150	3000
WPC	WPC2512GL0M75FWR	2512	6432	0.75	±1.0%	3	±150	3000
WPC	WPC2512RLR001FWR	2512	6432	1	±1.0%	3	±100	3000
WPC	WPC2512QLR002FWR	2512	6432	2	±1.0%	3	±50	3000
WPC	WPC2512QLR003FWR	2512	6432	3	±1.0%	3	±50	3000
WPC	WPC2512QLR004FWR	2512	6432	4	±1.0%	3	±50	3000
WPC	WPC2512QLR005FYR	2512	6432	5	±1.0%	3	±50	4000
WPC	WPC2512QLR006FYR	2512	6432	6	±1.0%	3	±50	4000
WPC	WPC2512QLR007FYR	2512	6432	7	±1.0%	3	±50	4000
WPC	WPC2512QLR008FYR	2512	6432	8	±1.0%	3	±50	4000
WPC	WPC2512QLR009FYR	2512	6432	9	±1.0%	3	±50	4000
WPC	WPC2512QLR010FYR	2512	6432	10	±1.0%	3	±50	4000
WPC	WPC2512QLR011FYR	2512	6432	11	±1.0%	3	±50	4000
WPC	WPC2512QLR012FYR	2512	6432	12	±1.0%	3	±50	4000
WPC	WPC2512QLR013FYR	2512	6432	13	±1.0%	3	±50	4000
WPC	WPC2512QLR014FYR	2512	6432	14	±1.0%	3	±50	4000
WPC	WPC2512QLR015FYR	2512	6432	15	±1.0%	3	±50	4000
WPC	WPC2512QLR016FYR	2512	6432	16	±1.0%	3	±50	4000
WPC	WPC2512QLR018FYR	2512	6432	18	±1.0%	3	±50	4000
WPC	WPC2512QLR020FYR	2512	6432	20	±1.0%	3	±50	4000
WPC	WPC2512QLR021FYR	2512	6432	21	±1.0%	3	±50	4000
WPC	WPC2512QLR022FYR	2512	6432	22	±1.0%	3	±50	4000
WPC	WPC2512QLR024FYR	2512	6432	24	±1.0%	3	±50	4000
WPC	WPC2512QLR027FYR	2512	6432	27	±1.0%	3	±50	4000
WPC	WPC2512QLR028FYR	2512	6432	28	±1.0%	3	±50	4000
WPC	WPC2512QLR030FYR	2512	6432	30	±1.0%	3	±50	4000
WPC	WPC2512QLR033FYR	2512	6432	33	±1.0%	3	±50	4000
WPC	WPC2512QLR034FYR	2512	6432	34	±1.0%	3	±50	4000
WPC	WPC2512QLR036FYR	2512	6432	36	±1.0%	3	±50	4000
WPC	WPC2512QLR039FYR	2512	6432	39	±1.0%	3	±50	4000
WPC	WPC2512QLR043FYR	2512	6432	43	±1.0%	3	±50	4000
WPC	WPC2512QLR047FYR	2512	6432	47	±1.0%	3	±50	4000
WPC	WPC2512QLR050FYR	2512	6432	50	±1.0%	3	±50	4000
WPC	WPC2512QLR051FYR	2512	6432	51	±1.0%	3	±50	4000
WPC	WPC2512QLR056FYR	2512	6432	56	±1.0%	3	±50	4000

**Note:** Resistors are available in steps of 1 mΩ. Ratings not indicated in the above table may be available on request

# Two-Terminal Surface Mount Resistor

## WPA/B/C Series

### Temperature De-rating Curve



### Storage / Environment Conditions

Products should be stored under the following environmental conditions.

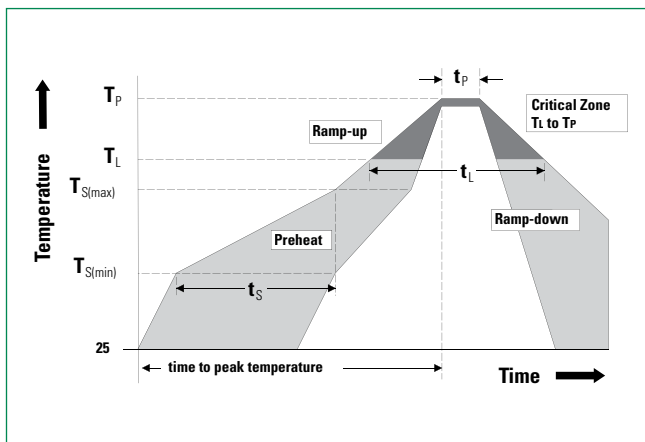
<b>Temperature:</b>	+5 to +35 °C
<b>Humidity:</b>	45 to 85% relative humidity
<b>Moisture Sensitivity Level:</b>	1, J-STD-020

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 oxidization 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
<b>Average Ramp-Up Rate (<math>T_{S(max)}</math> to <math>T_p</math>)</b>	3 °C / second max
<b>Preheat</b>	
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
<b>Time maintained above</b>	
Temperature Minimum ( $T_L$ )	217 °C
Time ( $t_L$ )	60–150 seconds
<b>Peak Temperature (<math>T_p</math>)</b>	260 +0 °C
<b>Time within 5 °C of Actual Peak Temperature (<math>t_p</math>)</b>	20–40 seconds
<b>Ramp-Down Rate</b>	6 °C / second Maximum
<b>Time 25 °C to Peak Temperature</b>	8 minutes Maximum

# Two-Terminal Surface Mount Resistor

## WPA/B/C Series

### Reliability Specifications

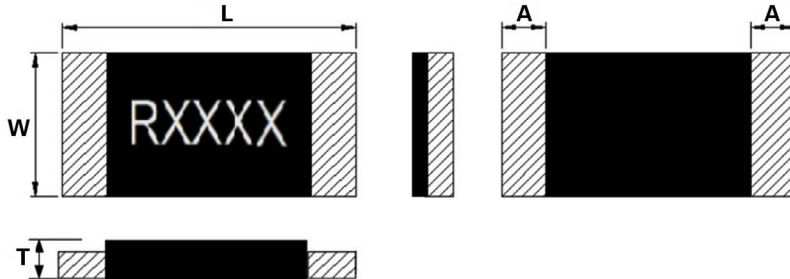
Test	Procedure	Specifications
<b>ESD</b>	HBM, 100pF, 1.5k ohms Repetition: 5 times Component Classification: 5C (25KV)	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
<b>Load Life (Operational Life)</b>	Test Temperature: 125°C Applied voltage: rated power (derated Power will be required if temp exceeds the derating point of part) Test Period: 1,000 hours (condition D)	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
<b>Biased Humidity</b>	Test conditions: 85°C and 85% RH 10% of rated power Test Period 1,000 hours	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
<b>Temp. Cycling (Thermal Shock)</b>	Repeat 1,000 cycles as follows: -55°C for 30 minutes 125°C for 30 minutes Transition time of 1 minute max	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
<b>High Temp. Exposure (Storage)</b>	Test Temp 125°C Test Period: 1,000 hours No Electrical Load	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
<b>Resistance to soldering heat</b>	Condition B (Solder dip, no pre-heat) 260°C	±1.0% Parts must meet initial electrical specs.
<b>Resistance to Solvents</b>	3 minute soak 2-3 ounce force 10 strokes/repetition 3 repetitions	Appearance: Without distinct damage, and the marking shall be legible.
<b>Terminal Strength (SMD)</b>	Applied force based on part size	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
<b>Flammability</b>	UL-94 V-0 or V-1 are acceptable Electrical test not required	V-0 burning less than 10 seconds or V-1 burning less than 30 seconds
<b>Flame Retardance</b>	Mounted parts subjected to voltages from 9.0 to 32 VDC (current clamped up to 500A)	No Flame when full automotive battery potential is applied.
<b>Vibration</b>	Frequency: 10-2,000 Hz Acceleration: 5G Test duration: 20 minutes, 12 cycles	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
<b>Mechanical Shock</b>	Force: 100G peak Test duration: 6 ms Half-sine waveform Velocity: 12.3ft/sec	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
<b>Board Flex</b>	90 mm span between fulcrums 2 mm bend 60 seconds minimum holding time	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
<b>Solderability</b>	Non-activated flux dip: 5-10 seconds SAC solder dip: 5 seconds at 245°C	A new solder shall cover minimum of 95%.

# Two-Terminal Surface Mount Resistor

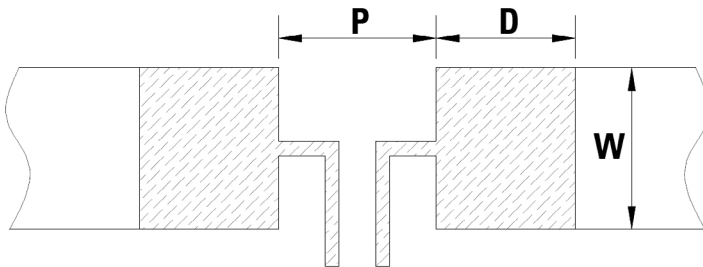
## WPA/B/C Series

### Dimensions

All dimensions in mm



Part Number	W	L	T	A
WPA1206 R001	1.60±0.20	3.30±0.20	0.90±0.20	0.70±0.30
WPA1206 R002-R005			0.80±0.20	
WPA1206 R006-R015				
WPB2512 0M50, 0M75	3.20±0.30	6.40±0.30	1.05±0.20	1.90±0.25
WPB2512 R001, 1M50	3.20±0.30	6.40±0.30	0.90±0.20	1.90±0.25
WPB2512 R002~R056	3.20±0.30	6.40±0.30	0.90±0.20	0.80±0.25
WPC2512 0M50~0M75	3.20±0.30	6.40±0.30	1.05±0.20	1.90±0.25
WPC2512 R001~R004	3.20±0.30	6.40±0.30	1.10±0.20	0.80±0.25
WPC2512 R001~R056	3.20±0.30	6.40±0.30	0.90±0.20	0.80±0.25



Part Number	P	W	D	Loading
WPA1206	1.20mm	1.84mm	1.80mm	1.0 W
WPB2512 0M50, 0M75, R001, 1M50	1.50 mm	3.57 mm	2.95 mm	2.0 W
WPB2512 R002~R056	3.18 mm	3.57 mm	2.11 mm	2.0 W
WPC2512 0M50~0M75	1.50 mm	3.57 mm	2.95 mm	3.0 W
WPC2512 R001~R056	3.18 mm	3.57 mm	2.11 mm	3.0 W

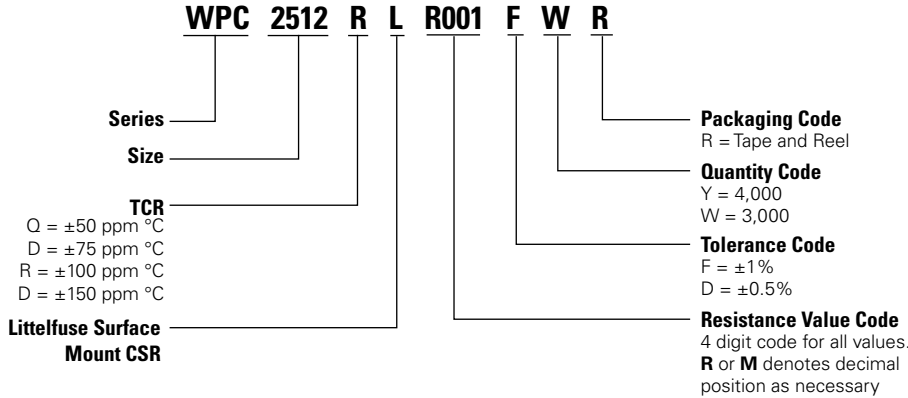
### Packaging

Part Number	Halogen Free	Packaging Option	Quantity	Quantity & Packaging Codes
WPA1206	Yes	Tape and Reel	4000	YR
WPB2512 0M50, 0M75	Yes	Tape and Reel	3000	WR
WPB2512 1M50, R001~R056	Yes	Tape and Reel	4000	YR
WPC2512 0M50, 0M75	Yes	Tape and Reel	3000	WR
WPC2512 R001~R004	Yes	Tape and Reel	3000	WR
WPC2512 R005~R056	Yes	Tape and Reel	4000	YR

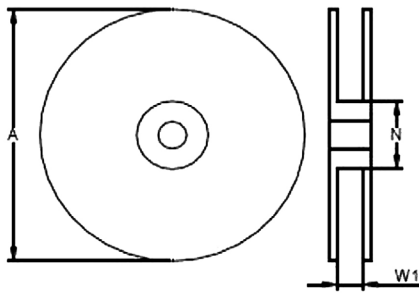
# Two-Terminal Surface Mount Resistor

## WPA/B/C Series

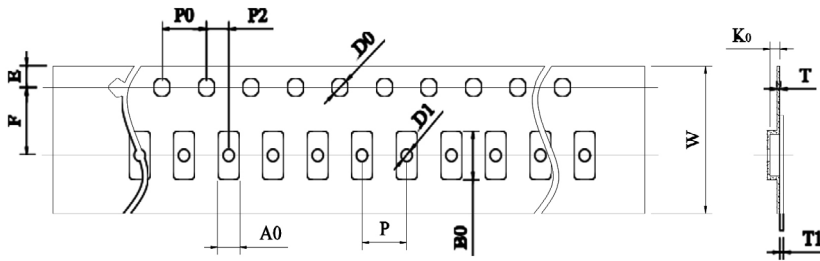
### Part Numbering System



### Tape and Reel Specifications



Part Number	A±5 (mm)	N±2 (mm)	W1±1 (mm)
WPA1206	178	60	9
WPB2512	178	60	13
WPC2512	178	60	13



Part Number	W (mm)	P0 (mm)	P (mm)	P2 (mm)	A0 (mm)	B0 (mm)	D0 (mm)	F (mm)	E (mm)	T (mm)	T1 (mm)	K0 (mm)
WPA1206	8.00±0.30	4.00±0.10	4.00±0.10	2.00±0.10	2.10±0.10	3.70±0.10	1.50±0.10	3.50±0.10	1.75±0.10	1.12±0.10	-	-
WPB2512 0M50, 0M75	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 +0.2/-0.1
WPB2512 R001, 1M50, R002~R004	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. 0.10	1.00 ±0.20
WPC2512 0M50, 0M75	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. 0.10	1.30 +0.2/-0.1
WPC2512 R001~R004	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. 0.10	1.30 ±0.20
WPC2512 R005~R056	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. 0.10	1.00±0.20

**Note:** Tape and reel packaging in accordance to EIA-481

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