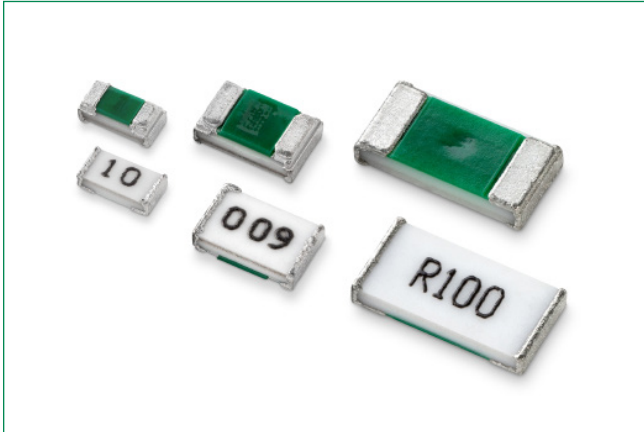


WSTM-A Series

AEC-Q200 Qualified > Two-Terminal Surface Mount Resistor

HF RoHS 



Description

Littelfuse WSTM-A Series low ohm current sense resistor is designed with long term stability in mind. This series is durable and excels at heat dissipation. The small package is optimal for most applications.

Features & Benefits

- AEC-Q200 qualified
- Low Temperature Coefficient of Resistance (TCR)
- Optimal linearity in I / V conversion
- Ceramic substrate
- Small size

Application

- Automotive
- Power management
- Low ESL

WSTM-A Series

AEC-Q200 Qualified > Two-Terminal Surface Mount Resistor

Electrical Specifications

Part Number	Size		Resistance		Power (W)	TCR (ppm)	Standard Package Quantity
	Inch	mm	Ro (mΩ)	Rt (%)			
WSTM0603LR005FNR-A	0603	1608	5	±1.0%	0.5	±100	5000
WSTM0603LR006FNR-A	0603	1608	6	±1.0%	0.5	±100	5000
WSTM0603LR009FNR-A	0603	1608	9	±1.0%	0.5	±100	5000
WSTM0603LR010FNR-A	0603	1608	10	±1.0%	0.5	±50	5000
WSTM0603LR015FNR-A	0603	1608	15	±1.0%	0.5	±50	5000
WSTM0603LR020FNR-A	0603	1608	20	±1.0%	0.5	±50	5000
WSTM0805LR005FNR-A	0805	2012	5	±1.0%	0.75	±100	5000
WSTM0805LR007FNR-A	0805	2012	7	±1.0%	0.75	±100	5000
WSTM0805LR008FNR-A	0805	2012	8	±1.0%	0.75	±100	5000
WSTM0805LR009FNR-A	0805	2012	9	±1.0%	0.75	±100	5000
WSTM0805LR013FNR-A	0805	2012	13	±1.0%	0.75	±50	5000
WSTM0805LR015FNR-A	0805	2012	15	±1.0%	0.75	±50	5000
WSTM0805LR016FNR-A	0805	2012	16	±1.0%	0.75	±50	5000
WSTM0805LR018FNR-A	0805	2012	18	±1.0%	0.75	±50	5000
WSTM0805LR020FNR-A	0805	2012	20	±1.0%	0.75	±50	5000
WSTM0805LR022FNR-A	0805	2012	22	±1.0%	0.75	±50	5000
WSTM0805LR024FNR-A	0805	2012	24	±1.0%	0.75	±50	5000
WSTM0805LR030FNR-A	0805	2012	30	±1.0%	0.75	±50	5000
WSTM0805LR033FNR-A	0805	2012	33	±1.0%	0.75	±50	5000
WSTM0805LR047FNR-A	0805	2012	47	±1.0%	0.75	±50	5000
WSTM0805LR100FNR-A	0805	2012	100	±1.0%	0.75	±50	5000
WSTM1206LR004FNR-A	1206	3216	4	±1.0%	1	±100	5000
WSTM1206LR005FNR-A	1206	3216	5	±1.0%	1	±100	5000
WSTM1206LR006FNR-A	1206	3216	6	±1.0%	1	±100	5000
WSTM1206LR007FNR-A	1206	3216	7	±1.0%	1	±100	5000
WSTM1206LR008FNR-A	1206	3216	8	±1.0%	1	±100	5000
WSTM1206LR009FNR-A	1206	3216	9	±1.0%	1	±100	5000
WSTM1206LR010FNR-A	1206	3216	10	±1.0%	1	±50	5000
WSTM1206LR011FNR-A	1206	3216	11	±1.0%	1	±50	5000
WSTM1206LR012FNR-A	1206	3216	12	±1.0%	1	±50	5000
WSTM1206LR015FNR-A	1206	3216	15	±1.0%	1	±50	5000
WSTM1206LR016FNR-A	1206	3216	16	±1.0%	1	±50	5000
WSTM1206LR018FNR-A	1206	3216	18	±1.0%	1	±50	5000
WSTM1206LR020FNR-A	1206	3216	20	±1.0%	1	±50	5000
WSTM1206LR022FNR-A	1206	3216	22	±1.0%	1	±50	5000
WSTM1206LR024FNR-A	1206	3216	24	±1.0%	1	±50	5000
WSTM1206LR027FNR-A	1206	3216	27	±1.0%	1	±50	5000
WSTM1206LR028FNR-A	1206	3216	28	±1.0%	1	±50	5000
WSTM1206LR030FNR-A	1206	3216	30	±1.0%	1	±50	5000
WSTM1206LR036FNR-A	1206	3216	36	±1.0%	1	±50	5000
WSTM1206LR039FNR-A	1206	3216	39	±1.0%	1	±50	5000
WSTM1206LR043FNR-A	1206	3216	43	±1.0%	1	±50	5000
WSTM1206LR047FNR-A	1206	3216	47	±1.0%	1	±50	5000

WSTM-A Series

AEC-Q200 Qualified > Two-Terminal Surface Mount Resistor

Electrical Specifications

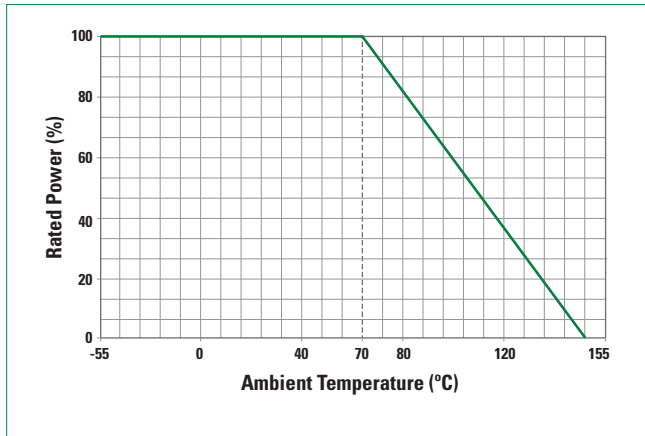
Part Number	Size		Resistance		Power (W)	TCR (ppm)	Standard Package Quantity
	Inch	mm	Ro (mΩ)	Rt (%)			
WSTM1206LR056FNR-A	1206	3216	56	±1.0%	1	±50	5000
WSTM1206LR062FNR-A	1206	3216	62	±1.0%	1	±50	5000
WSTM1206LR075FNR-A	1206	3216	75	±1.0%	1	±50	5000
WSTM2512LR002FYR-A	2512	6432	2	±1.0%	2	±75	4000
WSTM2512LR003FYR-A	2512	6432	3	±1.0%	2	±75	4000
WSTM2512LR005FYR-A	2512	6432	5	±1.0%	2	±50	4000
WSTM2512LR006FYR-A	2512	6432	6	±1.0%	2	±50	4000
WSTM2512LR007FYR-A	2512	6432	7	±1.0%	2	±50	4000
WSTM2512LR010FYR-A	2512	6432	10	±1.0%	2	±50	4000
WSTM2512LR012FYR-A	2512	6432	12	±1.0%	2	±50	4000
WSTM2512LR015FYR-A	2512	6432	15	±1.0%	2	±50	4000
WSTM2512LR016FYR-A	2512	6432	16	±1.0%	2	±50	4000
WSTM2512LR018FYR-A	2512	6432	18	±1.0%	2	±50	4000
WSTM2512LR020FYR-A	2512	6432	20	±1.0%	2	±50	4000
WSTM2512LR022FYR-A	2512	6432	22	±1.0%	2	±50	4000
WSTM2512LR027FYR-A	2512	6432	27	±1.0%	2	±50	4000
WSTM2512LR030FYR-A	2512	6432	30	±1.0%	2	±50	4000
WSTM2512LR033FYR-A	2512	6432	33	±1.0%	2	±50	4000
WSTM2512LR036FYR-A	2512	6432	36	±1.0%	2	±50	4000
WSTM2512LR051FYR-A	2512	6432	51	±1.0%	2	±50	4000
WSTM2512LR068FYR-A	2512	6432	68	±1.0%	2	±50	4000
WSTM2512LR075FYR-A	2512	6432	75	±1.0%	2	±50	4000

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

WSTM-A Series

AEC-Q200 Qualified > Two-Terminal Surface Mount Resistor

Temperature De-rating Curve



Storage / Environment Conditions

Products should be stored under the following environmental conditions.

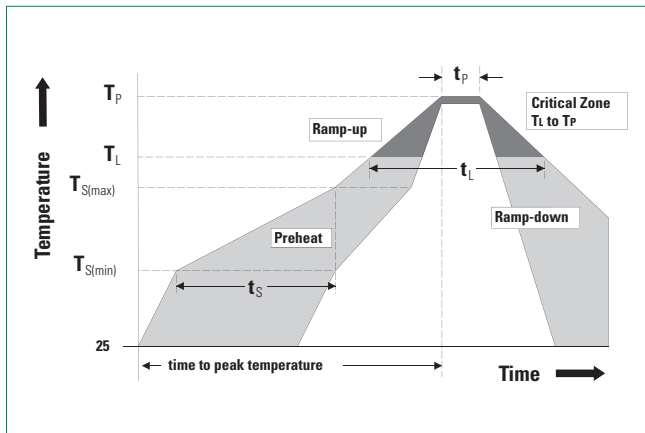
Temperature:	+5 to +35 °C
Humidity:	45 to 85% relative humidity
Moisture Sensitivity Level:	1, J-STD-020

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 – Reflow 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

WSTM-A Series

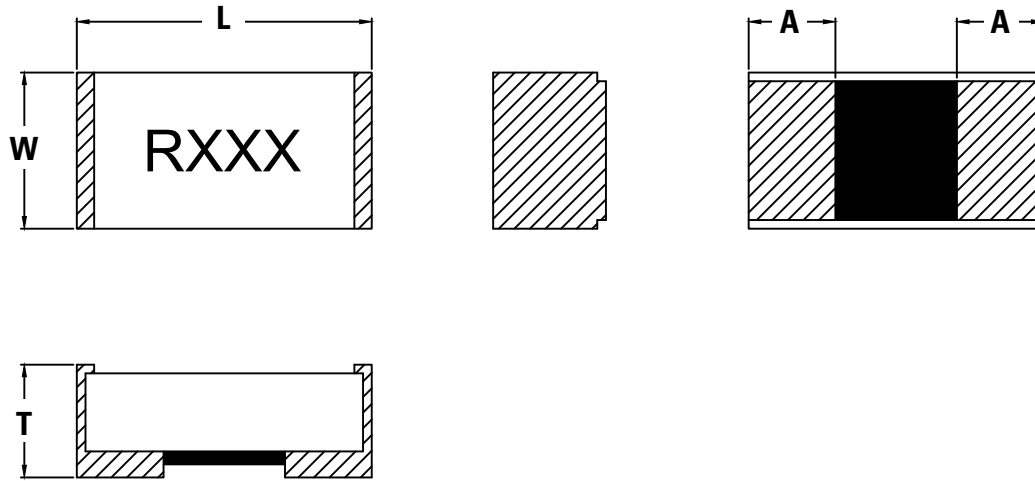
AEC-Q200 Qualified > Two-Terminal Surface Mount Resistor

Reliability Specifications

Test	Procedure	Specifications
ESD	HBM, 100pF, 1.5k ohms Repetition: 5 times Component Classification: 5C (25KV)	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
Load Life (Operational Life)	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.
Biased Humidity	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.
Temp. Cycling (Thermal Shock)	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.
High Temp. Exposure (Storage)	Test Temp 125°C Test Period: 1,000 hours No Electrical Load	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
Resistance to soldering heat	Condition B (Solder dip, no pre-heat) 260°C	±1.0% Parts must meet initial electrical specs.
Resistance to Solvents	3 minute soak 2-3 ounce force 10 strokes/repetition 3 repetitions	Appearance: Without distinct damage, and the marking shall be legible.
Terminal Strength (SMD)	Applied force based on part size	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
Flammability	UL-94 V-0 or V-1 are acceptable Electrical test not required	V-0 burning less than 10 seconds V-1 burning less than 30 seconds
Flame Retardance	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.
Vibration	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.
Mechanical Shock	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.
Board Flex	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.
Solderability	Non-activated flux dip: 5-10 seconds SAC solder dip: 5 seconds at 245°C	A new solder shall cover minimum of 95%.

WSTM-A Series**AEC-Q200 Qualified > Two-Terminal Surface Mount Resistor****Dimensions**

All dimensions in mm



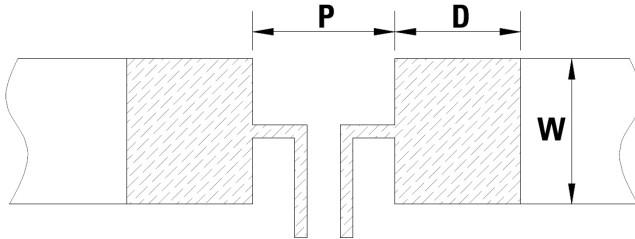
Part Number	W	L	T	A
WSTM0603-A R005	0.90±0.20	1.70±0.20	0.65±0.15	0.50±0.20
WSTM0603-A R006~R100	0.90±0.20	1.70±0.20	0.65±0.15	0.40±0.20
WSTM0805-A R003	1.35±0.20	2.10±0.20	0.65±0.20	0.65±0.20
WSTM0805-A R004~R100	1.35±0.20	2.10±0.20	0.65±0.20	0.50±0.20
WSTM1206-A R003	1.70±0.20	3.30±0.20	0.65±0.20	1.20±0.30
WSTM1206-A R004~R100	1.70±0.20	3.30±0.20	0.65±0.20	0.68±0.30
WSTM2512-A R002	3.20±0.30	6.40±0.30	0.65±0.20	2.80±0.30
WSTM2512-A R003	3.20±0.30	6.40±0.30	0.65±0.20	2.60±0.30
WSTM2512-A R004~R100	3.20±0.30	6.40±0.30	0.65±0.20	1.05±0.30

WSTM-A Series

AEC-Q200 Qualified > Two-Terminal Surface Mount Resistor

Recommended Land Pattern

All dimensions in mm

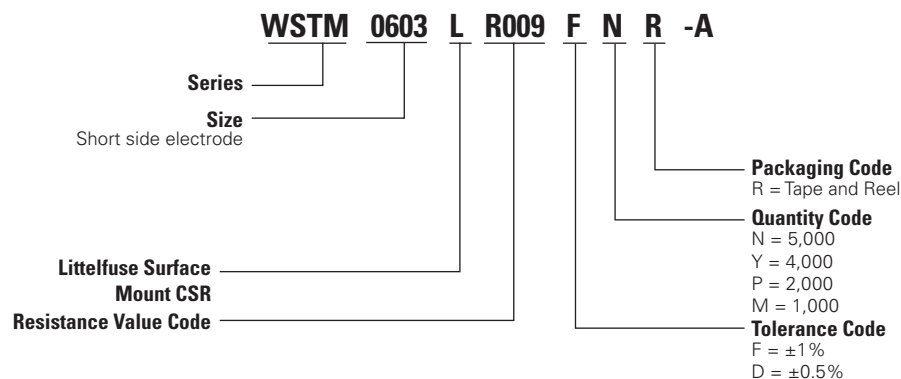


Part Number	P	W	D	Loading
WSTM0603-A R005	0.50	0.92	1.35	0.50 W
WSTM0603-A R006~R100	0.60	0.92	1.30	0.50 W
WSTM0805-A R003	0.50	1.44	1.55	0.75 W
WSTM0805-A R004~R100	0.80	1.44	1.40	0.75 W
WSTM1206-A R003	0.60	1.84	2.10	1.0 W
WSTM1206-A R004~R100	1.20	1.84	1.80	1.0 W
WSTM2512-A R002	0.60	3.57	4.35	2.0 W
WSTM2512-A R003	0.90	3.57	4.20	2.0 W
WSTM2512-A R004~R100	3.10	3.57	3.10	2.0 W

Packaging

Part Number	Halogen Free	Packaging Option	Quantity	Quantity & Packaging Codes
WSTM0603-A	Yes	Tape and Reel	5000	NR
WSTM0805-A	Yes	Tape and Reel	5000	NR
WSTM1206-A	Yes	Tape and Reel	5000	NR
WSTM2512-A	Yes	Tape and Reel	4000	YR

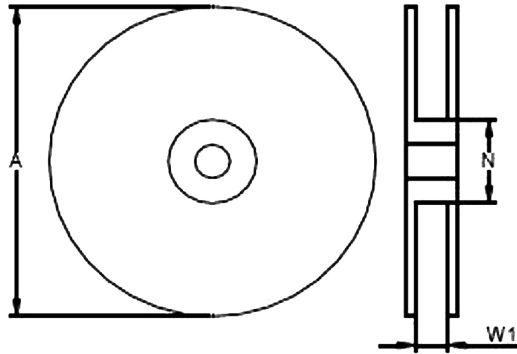
Part Numbering System



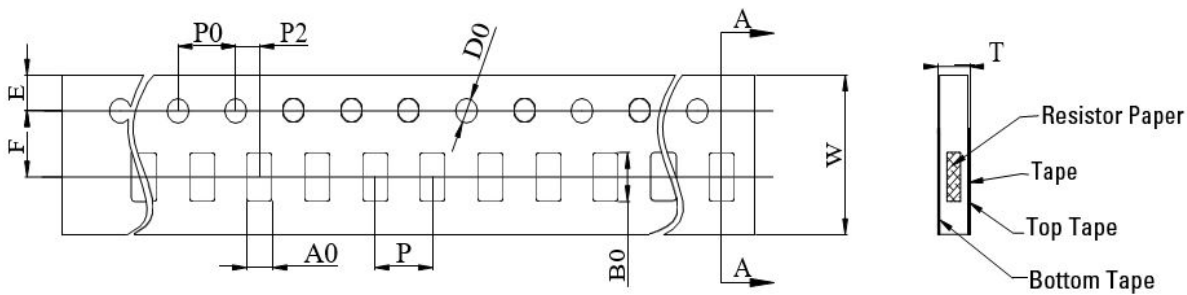
WSTM-A Series

AEC-Q200 Qualified > Two-Terminal Surface Mount Resistor

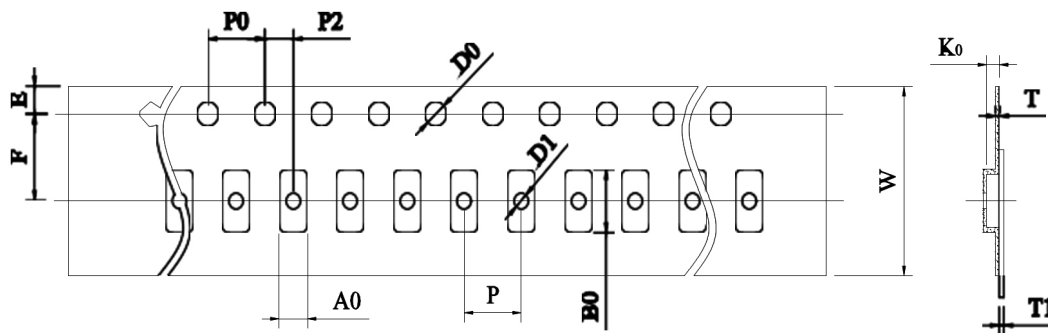
Tape and Reel Specifications



Part Number	A±5 (mm)	N±2 (mm)	W1±1 (mm)
WSTM0603-A	178	60	9.0
WSTM0805-A	178	60	9.0
WSTM1206-A	178	60	9.0
WSTM2512-A	178	60	13



Part Number	W	P0	P	P2	A0	B0	D0	F	E	T	/	/
WSTM0603-A	8.00±0.30	4.00±0.10	4.00±0.10	2.00±0.10	1.10±0.10	1.90±0.10	1.50±0.10	3.50±0.10	1.75±0.10	0.75±0.10	/	/
WSTM0805-A	8.00±0.30	4.00±0.10	4.00±0.10	2.00±0.10	1.55±0.10	2.30±0.10	1.50±0.10	3.50±0.10	1.75±0.10	0.87±0.10	/	/
WSTM1206-A	8.00±0.30	4.00±0.10	4.00±0.10	2.00±0.10	2.05±0.20	3.65±0.20	1.50±0.10	3.50±0.10	1.75±0.10	0.87±0.10	/	/



Part Number	W	P0	P	P2	A0	B0	D0	F	E	T	T1	K0
WSTM2512-A	12.0±0.30	4.00±0.10	4.00±0.10	2.00±0.10	3.40±0.20	6.75±0.20	1.50±0.10	5.50±0.10	1.75±0.10	0.25±0.10	Max 0.10	1.00±0.20

Note: Tape and reel packaging according to EIA-481

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