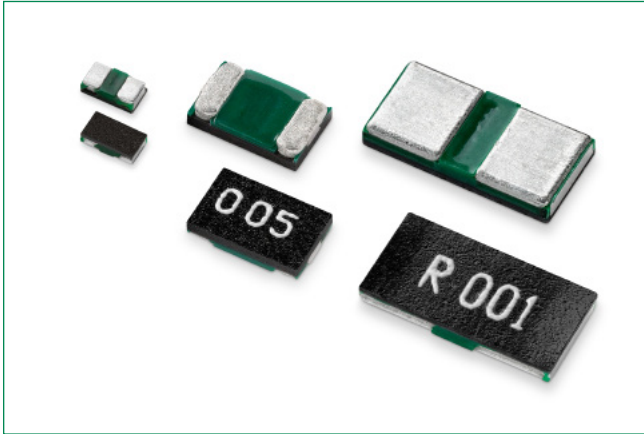


Two-Terminal Surface Mount Resistor

WSTC Series

HF **RoHS** **Pb**

Description

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

Features & Benefits

- Low TCR
- Optimal linearity in I / V conversion
- Epoxy substrate
- Small size
- High voltage

Application

- Power management
- Low ESL

Additional Information

[Resources](#)[Accessories](#)[Samples](#)

Two-Terminal Surface Mount Resistor

WSTC Series

Electrical Specifications

Part Number	Size		Resistance Value		Power Rating (W)	TCR (ppm / °C)	Standard Package Quantity
	Inch	mm	Ro (mΩ)	Rt (%)			
WSTC0402RLR043FKR	0402	1005	43	±1.0%	0.25	±100	10000
WSTC0402RLR047FKR	0402	1005	47	±1.0%	0.25	±100	10000
WSTC0402RLR050FKR	0402	1005	50	±1.0%	0.25	±100	10000
WSTC0402RLR005FKR	0402	1005	5	±1.0%	0.33	±100	10000
WSTC0402RLR006FKR	0402	1005	6	±1.0%	0.33	±100	10000
WSTC0402RLR007FKR	0402	1005	7	±1.0%	0.33	±100	10000
WSTC0402RLR008FKR	0402	1005	8	±1.0%	0.33	±100	10000
WSTC0402RLR009FKR	0402	1005	9	±1.0%	0.33	±100	10000
WSTC0402RLR010FKR	0402	1005	10	±1.0%	0.33	±100	10000
WSTC0402RLR011FKR	0402	1005	11	±1.0%	0.33	±100	10000
WSTC0402RLR012FKR	0402	1005	12	±1.0%	0.33	±100	10000
WSTC0402RLR013FKR	0402	1005	13	±1.0%	0.33	±100	10000
WSTC0402RLR014FKR	0402	1005	14	±1.0%	0.33	±100	10000
WSTC0402RLR015FKR	0402	1005	15	±1.0%	0.33	±100	10000
WSTC0402RLR016FKR	0402	1005	16	±1.0%	0.33	±100	10000
WSTC0402RLR018FKR	0402	1005	18	±1.0%	0.33	±100	10000
WSTC0402RLR019FKR	0402	1005	19	±1.0%	0.33	±100	10000
WSTC0402RLR020FKR	0402	1005	20	±1.0%	0.33	±100	10000
WSTC0402RLR021FKR	0402	1005	21	±1.0%	0.33	±100	10000
WSTC0402RLR022FKR	0402	1005	22	±1.0%	0.33	±100	10000
WSTC0402RLR024FKR	0402	1005	24	±1.0%	0.33	±100	10000
WSTC0603RLR003FNR	0603	1608	3	±1.0%	0.33	±100	5000
WSTC0603RLR004FNR	0603	1608	4	±1.0%	0.33	±100	5000
WSTC0603RLR005DNR	0603	1608	5	±0.5%	0.33	±100	5000
WSTC0603DLR006FNR	0603	1608	6	±1.0%	0.33	±75	5000
WSTC0603DLR007FNR	0603	1608	7	±1.0%	0.33	±75	5000
WSTC0603DLR008FNR	0603	1608	8	±1.0%	0.33	±75	5000
WSTC0603DLR009FNR	0603	1608	9	±1.0%	0.33	±75	5000
WSTC0603DLR010FNR	0603	1608	10	±1.0%	0.33	±75	5000
WSTC0603DLR011FNR	0603	1608	11	±1.0%	0.33	±75	5000
WSTC0603DLR012FNR	0603	1608	12	±1.0%	0.33	±75	5000
WSTC0603DLR013FNR	0603	1608	13	±1.0%	0.33	±75	5000
WSTC0603DLR014FNR	0603	1608	14	±1.0%	0.33	±75	5000
WSTC0603DLR015FNR	0603	1608	15	±1.0%	0.33	±75	5000
WSTC0603DLR016FNR	0603	1608	16	±1.0%	0.33	±75	5000
WSTC0603DLR018FNR	0603	1608	18	±1.0%	0.33	±75	5000
WSTC0603DLR020FNR	0603	1608	20	±1.0%	0.33	±75	5000
WSTC0805RL1M50FNR	0805	2012	1.5	±1.0%	0.5	±100	5000
WSTC0805GLR001FNR	0805	2012	1	±1.0%	0.5	±150	5000
WSTC0805DLR002FNR	0805	2012	2	±1.0%	0.5	±75	5000
WSTC0805DLR003FNR	0805	2012	3	±1.0%	0.5	±75	5000

Two-Terminal Surface Mount Resistor

WSTC Series

Electrical Specifications

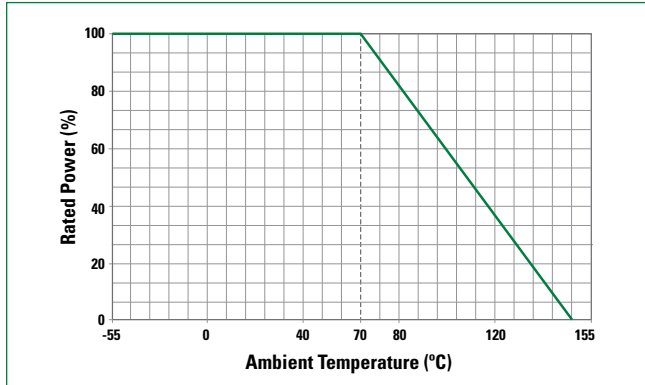
Part Number	Size		Resistance Value		Power Rating (W)	TCR (ppm / °C)	Standard Package Qty
	Inch	mm	Ro (mΩ)	Rt (%)			
WSTC0805DLR004FNR	0805	2012	4	±1.0%	0.5	±75	5000
WSTC0805DLR005FNR	0805	2012	5	±1.0%	0.5	±75	5000
WSTC0805QLR006FNR	0805	2012	6	±1.0%	0.5	±50	5000
WSTC0805QLR007FNR	0805	2012	7	±1.0%	0.5	±50	5000
WSTC0805QLR008FNR	0805	2012	8	±1.0%	0.5	±50	5000
WSTC0805QLR009FNR	0805	2012	9	±1.0%	0.5	±50	5000
WSTC0805QLR010FNR	0805	2012	10	±1.0%	0.5	±50	5000
WSTC0805QLR011FNR	0805	2012	11	±1.0%	0.5	±50	5000
WSTC0805QLR012FNR	0805	2012	12	±1.0%	0.5	±50	5000
WSTC0805QLR013FNR	0805	2012	13	±1.0%	0.5	±50	5000
WSTC0805QLR014FNR	0805	2012	14	±1.0%	0.5	±50	5000
WSTC0805QLR015FNR	0805	2012	15	±1.0%	0.5	±50	5000
WSTC0805QLR016FNR	0805	2012	16	±1.0%	0.5	±50	5000
WSTC0805QLR018FNR	0805	2012	18	±1.0%	0.5	±50	5000
WSTC0805QLR020FNR	0805	2012	20	±1.0%	0.5	±50	5000
WSTC1206DLR001FNR	1206	3216	1	±1.0%	1	±75	5000
WSTC1206DLR002FNR	1206	3216	2	±1.0%	1	±75	5000
WSTC1206DLR003FNR	1206	3216	3	±1.0%	1	±75	5000
WSTC1206DLR004FNR	1206	3216	4	±1.0%	1	±75	5000
WSTC1206QLR005FNR	1206	3216	5	±1.0%	1	±50	5000
WSTC1206QLR006FNR	1206	3216	6	±1.0%	1	±50	5000
WSTC1206QLR007FNR	1206	3216	7	±1.0%	1	±50	5000
WSTC1206QLR008FNR	1206	3216	8	±1.0%	1	±50	5000
WSTC1206QLR009FNR	1206	3216	9	±1.0%	1	±50	5000
WSTC1206QLR010FNR	1206	3216	10	±1.0%	1	±50	5000
WSTC1206QLR011FNR	1206	3216	11	±1.0%	1	±50	5000
WSTC1206QLR012FNR	1206	3216	12	±1.0%	1	±50	5000
WSTC1206QLR013FNR	1206	3216	13	±1.0%	1	±50	5000
WSTC1206QLR014FNR	1206	3216	14	±1.0%	1	±50	5000
WSTC1206QLR015FNR	1206	3216	15	±1.0%	1	±50	5000
WSTC1206QLR016FNR	1206	3216	16	±1.0%	1	±50	5000
WSTC1206QLR018FNR	1206	3216	18	±1.0%	1	±50	5000
WSTC1206QLR020FNR	1206	3216	20	±1.0%	1	±50	5000

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

Two-Terminal Surface Mount Resistor

WSTC Series

Temperature De-rating Curve



Storage / Environment Conditions

Products should be stored under the following environmental conditions.

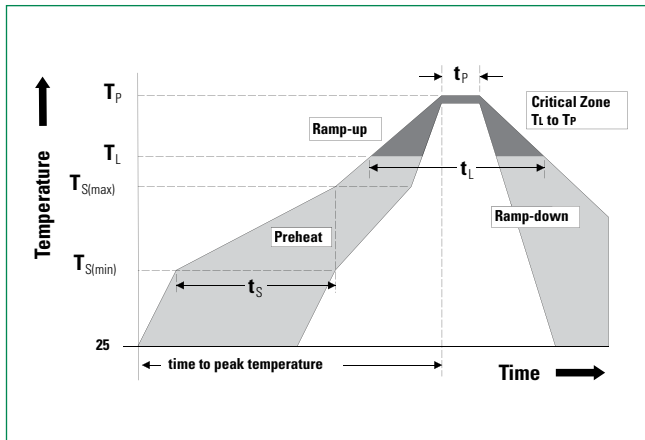
Temperature:	+5 to +35 °C
Humidity:	45 to 85% relative humidity
Moisture Sensitivity Level:	1, J-STD-020

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

Two-Terminal Surface Mount Resistor

WSTC Series

Reliability Specifications

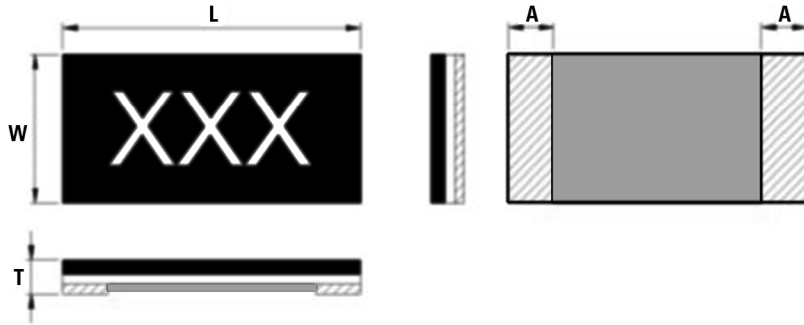
Test	Procedure	Specifications
ESD	HBM, 100pF, 1.5k ohms Repetition: 5 times Component Classification: 5C (25KV)	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
Load Life (Operational Life)	Test Temperature: 125°C Applied voltage: rated power (derated Power will be required 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.

Two-Terminal Surface Mount Resistor

WSTC Series

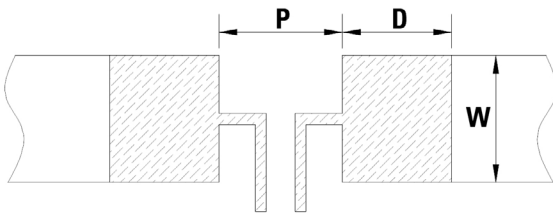
Dimensions

All dimensions in mm



Part Number	W	L	T	A
WSTC0402 2M50~R003	0.55±0.10	1.00±0.10	0.30±0.05	0.30±0.10
WSTC0402 R005~R025, R040~R050	0.55±0.10	1.00±0.10	0.30±0.05	0.23±0.10
WSTC0603L R002	0.80±0.25	1.60±0.25	0.35±0.20	0.45±0.20
WSTC0603 2M50~R003	0.80±0.25	1.60±0.25	0.35±0.20	0.35±0.20
WSTC0603 R004~R020	0.80±0.25	1.60±0.25	0.35±0.20	0.30±0.20
WSTC0805 R001~1M50	1.25±0.25	2.00±0.25	0.40±0.20	0.70±0.20
WSTC0805 R002~2M50	1.25±0.25	2.00±0.25	0.40±0.20	0.60±0.20
WSTC0805 R003~R020	1.25±0.25	2.00±0.25	0.40±0.20	0.40±0.20
WSTC1206 R001~1M50	1.60±0.25	3.20±0.25	0.40±0.20	1.25±0.30
WSTC1206 R002	1.60±0.25	3.20±0.25	0.40±0.20	1.05±0.30
WSTC1206 R003	1.60±0.25	3.20±0.25	0.40±0.20	0.80±0.30
WSTC1206 R004~R020	1.60±0.25	3.20±0.25	0.40±0.20	0.60±0.30

Recommended Land Pattern



Part Number	P	W	D	Loading
WSTC0402 2M50~R003	0.35	0.60	0.60	0.33 W
WSTC0402 R005~R025	0.40	0.60	0.60	0.33 W
WSTC0402 R040~R050	0.40	0.60	0.60	0.25 W
WSTC0603 R002	0.38	0.92	1.41	0.33 W
WSTC0603 2M50~R003	0.50	0.92	1.35	0.33 W
WSTC0603 R004~R020	0.60	0.92	1.30	0.33 W
WSTC0805 R001	0.40	1.44	1.60	0.50 W
WSTC0805 1M50~2M50	0.50	1.44	1.55	0.50 W
WSTC0805 R003~R020	0.80	1.44	1.40	0.50 W
WSTC1206 R001~1M50	0.50	1.84	2.15	1.0 W
WSTC1206 R002	0.60	1.84	2.10	1.0 W
WSTC1206 R003~R020	1.20	1.84	1.80	1.0 W

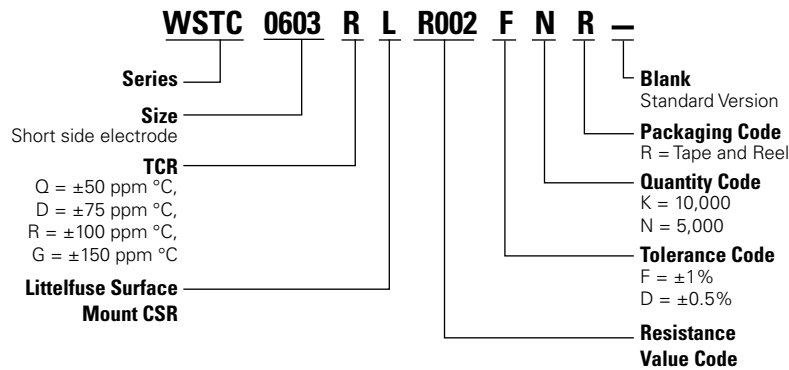
Two-Terminal Surface Mount Resistor

WSTC Series

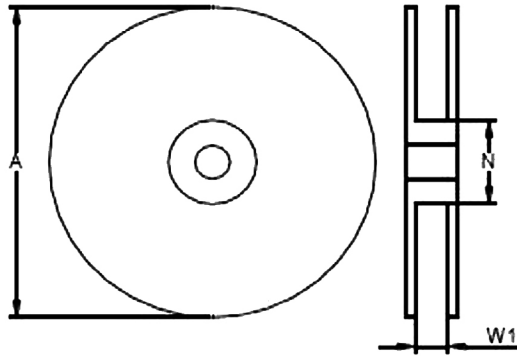
Packaging

Part Number	Halogen Free	Packaging Option	Quantity	Quantity & Packaging Codes
WSTC0402	Yes	Tape and Reel	10000	KR
WSTC0603	Yes	Tape and Reel	5000	NR
WSTC0805	Yes	Tape and Reel	5000	NR
WSTC1206	Yes	Tape and Reel	5000	NR

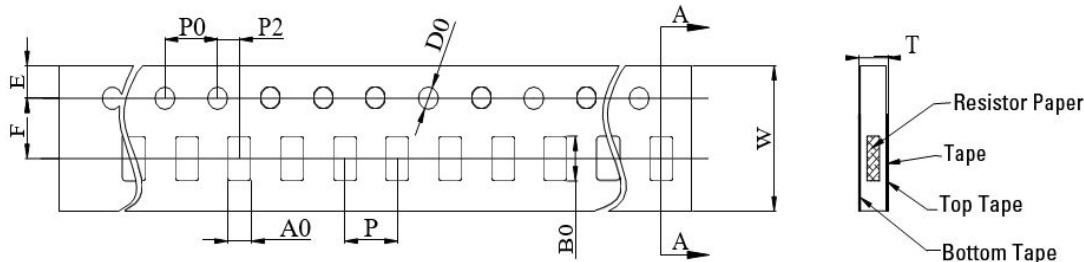
Part Numbering System



Tape and Reel Specifications



Part Number	A ± 5 (mm)	N ± 2 (mm)	W1 ± 1 (mm)
WSTC0402	178	60	9.0
WSTC0603	178	60	9.0
WSTC0805	178	60	9.0
WSTC1206	178	60	9.0



Part Number	W	P0	P	P2	A0	B0	D0	F	E	T
WSTC0402	8.00 ± 0.30	4.00 ± 0.10	2.00 ± 0.10	2.00 ± 0.10	0.65 ± 0.10	1.10 ± 0.10	1.50 ± 0.10	3.50 ± 0.10	1.75 ± 0.10	0.42 ± 0.05
WSTC0603	8.00 ± 0.30	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	0.98 ± 0.10	1.85 ± 0.10	1.50 ± 0.10	3.50 ± 0.10	1.75 ± 0.10	0.60 ± 0.05
WSTC0805	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	0.75 ± 0.10
WSTC1206	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	0.75 ± 0.10

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