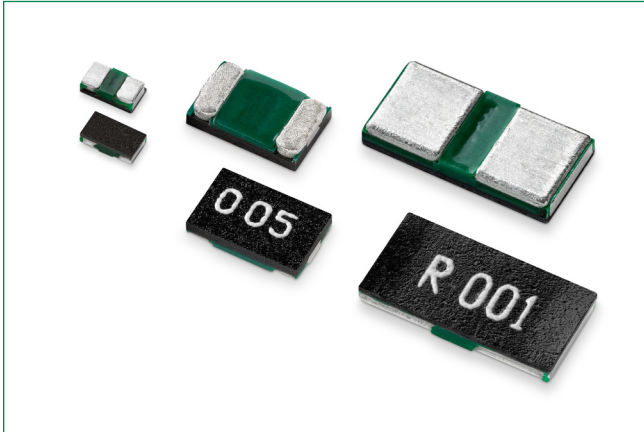


Two-Terminal Surface Mount Resistor

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

- Low TCR
- Optimal linearity in I / V conversion
- Epoxy substrate

Benefits

- 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

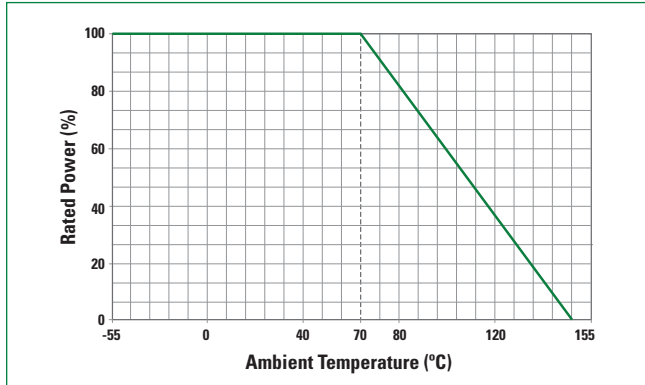
Part Number	Size		Resistance Value		Power Rating (W)	TCR (ppm / °C)	Standard Package Qty
	Inch	mm	Ro (mΩ)	Rt (%)			
WSTC0805DLR004FNR	0805	2012	4	±1.0%	0.5	±75	5000
WSTC0805DLR005FNR	0805	2012	5	±1.0%	0.5	±75	5000
WSTC0805QLR006FNR	0805	2012	6	±1.0%	0.5	±50	5000
WSTC0805QLR007FNR	0805	2012	7	±1.0%	0.5	±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.

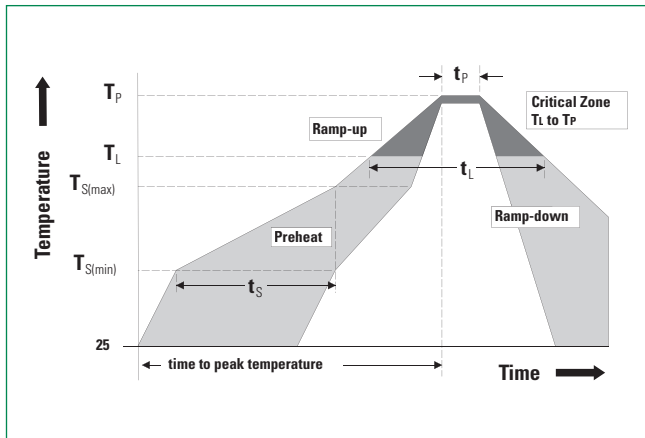
Temperature:	+5 to +35 °C
Humidity:	45 to 85% relative humidity
Moisture Sensitivity Level:	1, J-STD-020

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

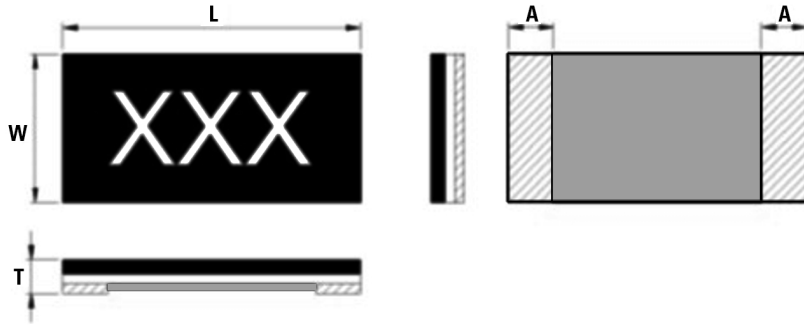
Test	Procedure	Specifications
Resistance Data	Resistance data at 25 °C	Must meet datasheet requirements
TCR Data	TCR data at 25 °C and 125 °C	Must meet datasheet requirements
Dimensional Data	Measure all dimensions specified in datasheet	Must meet datasheet requirements
Short Time Overload IEC60115-1 4.13	Applied voltage: 2.5X rated power. Test duration: 5 seconds Test temperature: 25 ± 2 °C	±(1.0%+0.5 mΩ)
High Temp. Exposure IEC60115-1 4.25	Test temperature: +155 ± 2 °C Test period: 1,000 hours No electrical load	±(1.0%+0.5 mΩ)
Low Temp. Storage IEC60115-1 4.25	Test temperature: -55 ± 2 °C Test period: 1,000 hours No electrical load	±(1.0%+0.5 mΩ)
Moisture Load Life IEC60115-1 4.25	V _{test} = V _{max} Test temperature: 60 ± 2 °C, RH: 95% Test period: 1,000 hours with power cycling as follows: 90 min. power ON / 30 min. power OFF	±(2.0%+0.5 mΩ)
Temperature Cycling (Thermal Shock) IEC60115-1 4.19	Test period: 100 cycles as follows: 90 min. power ON / 30 min. power OFF	±(1.0%+0.5 mΩ)
Load Life IEC60115-1 4.25	V _{test} = V _{max} Test temperature: 70 ± 2 °C Test period: 1,000 hours with power cycling as follows: 90 min. power ON / 30 min. power OFF	±(2.0%+0.5 mΩ)
Solderability IEC60115-1 4.17	Dipped into solder at Test temperature 245 ± 5 °C Test period: 3 ± 0.5 seconds	The covered area >95%
Resistance to Solder Heat IEC60115-1 4.18	Through Reflow Parts are subjected to 3 reflow cycles	±(1.0%+0.5 mΩ)
Mechanical Shock IEC60115-1 4.21	A = 100G Test period: 6 milliseconds	±(1.0%+0.5 mΩ)
Substrate Bending IEC60115-1 4.33	Span between fulcrums: 90 mm Bend width: 2 mm Test board: glass-epoxy Thickness: 1.6 mm	±1.0%

Two-Terminal Surface Mount Resistor

WSTC Series

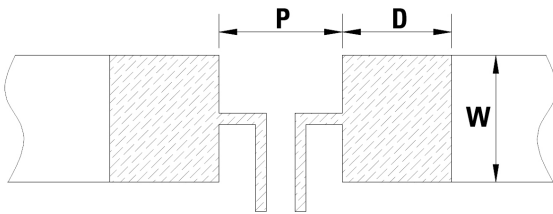
Dimensions

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

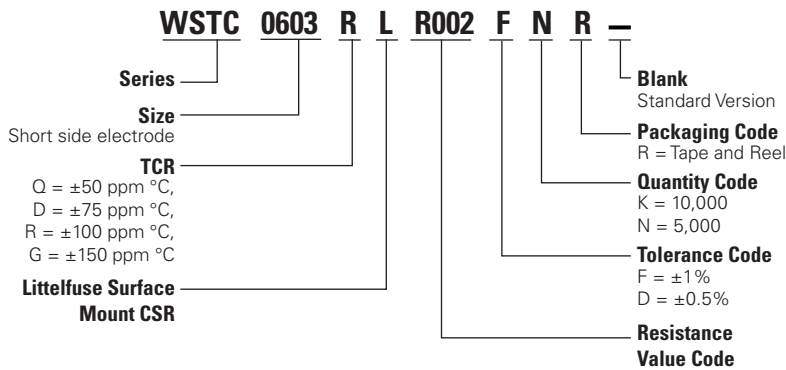
Two-Terminal Surface Mount Resistor

WSTC Series

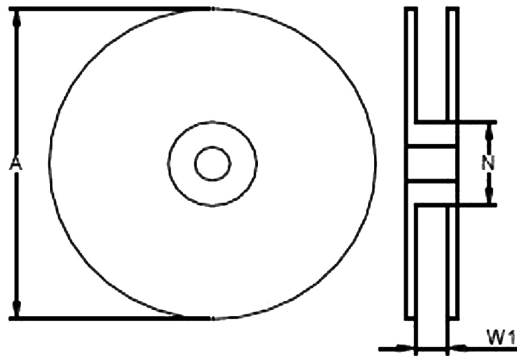
Packaging

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

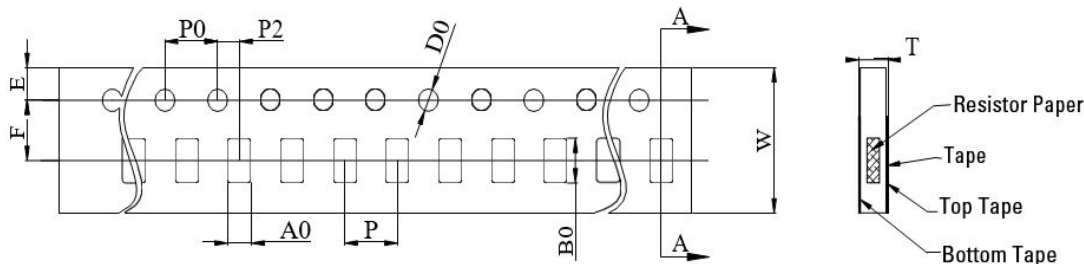
Part Numbering System



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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<u>WSTC0402RLR005FKR</u>	<u>WSTC0402RLR006FKR</u>	<u>WSTC0402RLR007FKR</u>	<u>WSTC0402RLR008FKR</u>
<u>WSTC0402RLR009FKR</u>	<u>WSTC0402RLR010FKR</u>	<u>WSTC0402RLR011FKR</u>	<u>WSTC0402RLR012FKR</u>
<u>WSTC0402RLR013FKR</u>	<u>WSTC0402RLR014FKR</u>	<u>WSTC0402RLR015FKR</u>	<u>WSTC0402RLR016FKR</u>
<u>WSTC0402RLR018FKR</u>	<u>WSTC0402RLR019FKR</u>	<u>WSTC0402RLR020FKR</u>	<u>WSTC0402RLR021FKR</u>
<u>WSTC0402RLR022FKR</u>	<u>WSTC0402RLR024FKR</u>	<u>WSTC0402RLR043FKR</u>	<u>WSTC0402RLR047FKR</u>
<u>WSTC0402RLR050FKR</u>	<u>WSTC0603DLR006FNR</u>	<u>WSTC0603DLR007FNR</u>	<u>WSTC0603DLR008FNR</u>
<u>WSTC0603DLR009FNR</u>	<u>WSTC0603DLR010FNR</u>	<u>WSTC0603DLR011FNR</u>	<u>WSTC0603DLR012FNR</u>
<u>WSTC0603DLR013FNR</u>	<u>WSTC0603DLR014FNR</u>	<u>WSTC0603DLR015FNR</u>	<u>WSTC0603DLR016FNR</u>
<u>WSTC0603DLR018FNR</u>	<u>WSTC0603DLR020FNR</u>	<u>WSTC0603RLR003FNR</u>	<u>WSTC0603RLR004FNR</u>
<u>WSTC0603RLR005DNR</u>	<u>WSTC0805DLR002FNR</u>	<u>WSTC0805DLR003FNR</u>	<u>WSTC0805DLR004FNR</u>
<u>WSTC0805DLR005FNR</u>	<u>WSTC0805GLR001FNR</u>	<u>WSTC0805QLR006FNR</u>	<u>WSTC0805QLR007FNR</u>
<u>WSTC0805QLR008FNR</u>	<u>WSTC0805QLR009FNR</u>	<u>WSTC0805QLR010FNR</u>	<u>WSTC0805QLR011FNR</u>
<u>WSTC0805QLR012FNR</u>	<u>WSTC0805QLR013FNR</u>	<u>WSTC0805QLR014FNR</u>	<u>WSTC0805QLR015FNR</u>
<u>WSTC0805QLR016FNR</u>	<u>WSTC0805QLR018FNR</u>	<u>WSTC0805QLR020FNR</u>	<u>WSTC0805RL1M50FNR</u>
<u>WSTC1206DLR001FNR</u>	<u>WSTC1206DLR002FNR</u>	<u>WSTC1206DLR003FNR</u>	<u>WSTC1206DLR004FNR</u>
<u>WSTC1206QLR005FNR</u>	<u>WSTC1206QLR006FNR</u>	<u>WSTC1206QLR007FNR</u>	<u>WSTC1206QLR008FNR</u>
<u>WSTC1206QLR009FNR</u>	<u>WSTC1206QLR010FNR</u>	<u>WSTC1206QLR011FNR</u>	<u>WSTC1206QLR012FNR</u>
<u>WSTC1206QLR013FNR</u>	<u>WSTC1206QLR014FNR</u>	<u>WSTC1206QLR015FNR</u>	<u>WSTC1206QLR016FNR</u>
<u>WSTC1206QLR018FNR</u>	<u>WSTC1206QLR020FNR</u>		