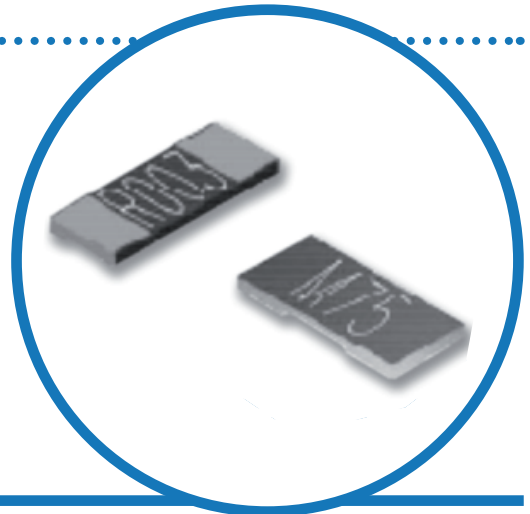


Metal Strip Current Sense Resistors Surface Mount

ULR Series

- Resistance R0005 (0.5mΩ) to R015 (15mΩ)
- Low TCR, Low inductance
- Designed for current sensing in power electronic systems
- Solid metal element withstands high current surges
- RoHS compliant
- AEC-Q200 Qualified



Electrical Data

		ULR1S	ULR1	ULR15S	ULR2	ULR25	ULR3
Footprint size		1206	2512	2010	2512	2512	2512
Power rating at 80°C	watts	1.0	1.0	1.5	2.0	2.5	3.0
Resistance range ¹	ohms	R001 to R01	R0005 to R015	R001 to R01	R0005 to R01	R004 to R006	R0005 to R003
Isolation voltage	volts	N/A	200V	N/A	200V	200V	200V
TCR	ppm/°C	50	50, 75, 100, 150 See table below	50	50	50	50, 100 See table below
Resistance tolerance	%	1(F), 5(I)					
Protective coating ²		None	Black/Green	None	Black/Green	Green	Green
Standard values		See table below for available values					
Ambient temperature range °C		-55 to +170					

Note 1: For values above R015 refer to our LR / LRF Series

Note 2: Colour of coating relates to solder process suitability, see Construction

Standard values available (non-standard values may be available to order - consult factory)

Value	ULR1S		ULR1		ULR15S		ULR2		ULR25		ULR3	
	Coat	TCR	Coat	TCR	Coat	TCR	Coat	TCR	Coat	TCR	Coat	TCR
R0005			Black	50			Black	50			Green	100
R00075			Black	50			Black	50			Green	100
R001	None	50	Black	50	None	50	Black	50			Green	50
R0015			Black	50			Black	50			Green	50
R002	None	50	Black	50	None	50	Black	50			Green	50
R0025			Black	150								
R003	None	50	Black	150	None	50					Green	50
R004	None	50	Black	100	None	50			Green	50		
R0045									Green	50		
R005	None	50	Black	100	None	50			Green	50		
R006	None	50	Black	75	None	50			Green	50		
R0065			Black	75			Green	50				
R007	None	50	Black	75	None	50	Green	50				
R008	None	50			None	50	Green	50				
R009	None	50			None	50	Green	50				
R01	None	50	Black	100	None	50	Green	50				
R011			Green	50								
R012			Green	50								
R013			Green	50								
R014			Green	50								
R015			Green	50								

General Note

TT electronics reserves the right to make changes in product specification without notice or liability.
All information is subject to TT electronics' own data and is considered accurate at time of going to print.

Construction

Black coat

A low TCR resistance alloy plate, with tin plated connection bands is protectively coated on the upper and lower faces and numerically marked with the resistance value. This part is suitable for wave or reflow soldering.

Green coat

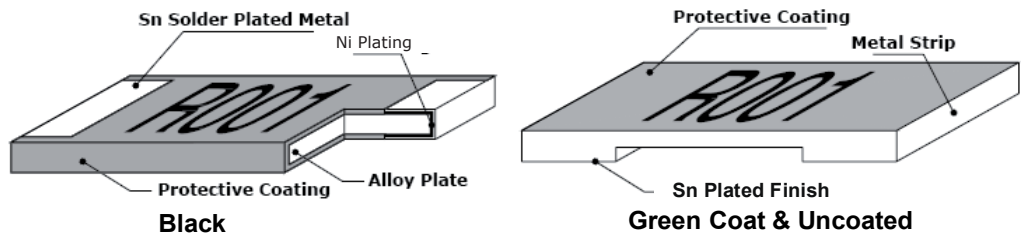
A low TCR resistance alloy plate is grooved to set the final resistance, the lower faces are tin plated for connections, and it is protectively coated on the upper and lower faces and numerically marked with the resistance value. This part is ONLY suitable for reflow soldering.

Uncoated

A low TCR resistance alloy plate is grooved to set the final resistance and the lower face only is protected with an epoxy coating. The lower faces are tin plated for connections. This part is ONLY suitable for reflow soldering.

Marking

Only 2512 size parts are marked. For values which are integer numbers of milliohms, the marking is 4-character IEC62 code; e.g. "R002" for 2mΩ, "R010" for 10mΩ. For values including fractions of a milliohm the marking is 3 or 4-character code using "M" to indicate the decimal point, e.g. "M75" for 0.75mΩ, "1M50" for 1.5mΩ.



Termination Details:

Material Matt tin plated finish over a barrier layer
Solderability 95% min coverage (MIL-STD 202F / 208H, 235°C 2 secs)

AEC-Q200 Table 7		Method		Max. (add R0005)	
ref.	Test			Black & uncoated	Green
3	High Temp. Exposure *	MIL-STD-202 Method 108	ΔR%	1	1
4	Temperature Cycling	JESD22 Method JA-104	ΔR%	0.5	0.5
6	Moisture Resistance	MIL-STD-202 Method 106	ΔR%	1	1
7	Biased Humidity	MIL-STD-202 Method 103	ΔR%	1	1
8	Operational Life (Cyclic Load) *	MIL-STD-202 Method 108	ΔR%	1	1
14	Vibration	MIL-STD-202 Method 204	ΔR%	0.5	0.5
15	Resistance to Soldering Heat *	MIL-STD-202 Method 210	ΔR%	0.5	1
16	Thermal Shock *	MIL-STD-202 Method 107	ΔR%	0.5	1
18	Solderability	J-STD-002		>95% coverage	
21	Board Flex	AEC-Q200-005	ΔR%	0.5	0.5
22	Terminal Strength	AEC-Q200-006	ΔR%	0.25	0.25
	Short Term Overload *	5 x Pr for 5s	ΔR%	0.5	1

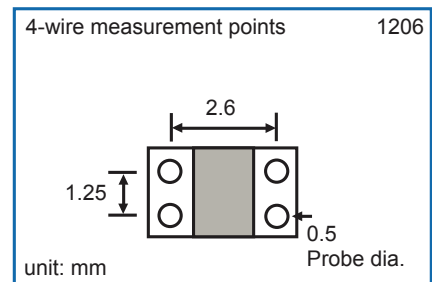
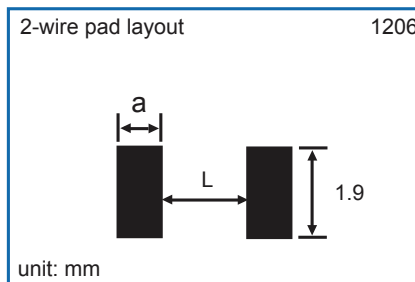
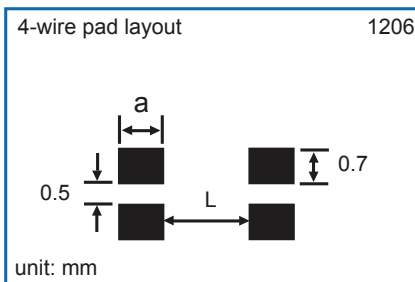
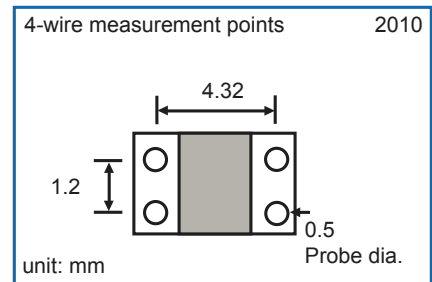
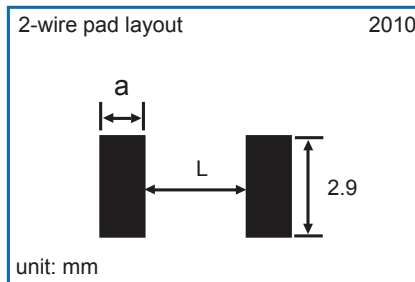
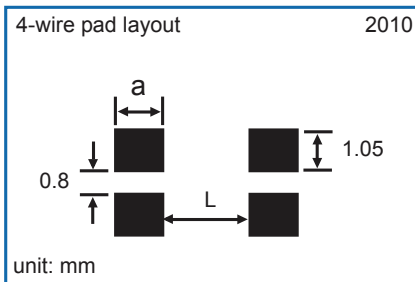
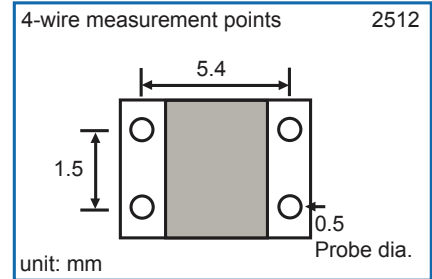
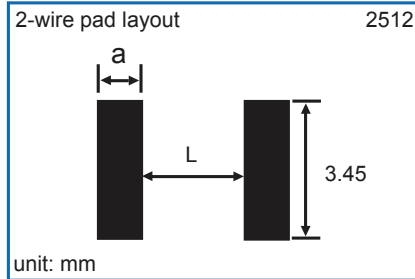
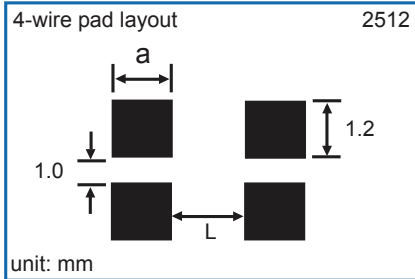
Notes: 1. Full AEC-Q200 qualification applies to 2512 size. The 1206 and 2010 sizes have received the tests marked *.



General Note

TT electronics reserves the right to make changes in product specification without notice or liability.
All information is subject to TT electronics' own data and is considered accurate at time of going to print.

Electrical Connections



Package	Resistance (mΩ)	a	L
2512 – Black	All	2.70	2.95
	0.5	3.13	0.52
	0.75	2.93	0.94
	1	2.38	2.04
	1.5	1.88	3.04
	2 – 3	1.63	3.54
	4 – 4.5	2.63	1.54
	5 – 6	2.38	2.04
2512 - Green	6.5 – 7	1.88	3.04
	8 - 15	1.63	3.54

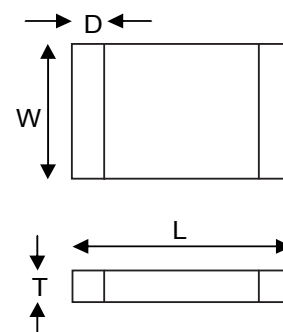
Package	Resistance (mΩ)	a	L
1206	1, 4 – 6	1.55	0.55
	2 – 3, 10	1.05	1.55
	7 – 9	1.35	0.95
	1, 4 - 5	2.29	0.95
2010	2, 6 – 8	1.99	1.55
	3	1.49	2.55
	9 - 10	1.74	2.05

General Note

TT electronics reserves the right to make changes in product specification without notice or liability.
All information is subject to TT electronics' own data and is considered accurate at time of going to print.

Physical Data

Dimensions (mm) and weight (g)							
Size	Coat	Values (mΩ)	L ±0.25	W	T ±0.20	D	Wt. (nom)
2512	Green	0.5	6.35	3.0 ±0.20	0.60	2.68 ±0.25	0.06
		0.75				2.48 ±0.25	
		1, 5, 6				1.93 ±0.25	
		1.5, 6.5, 7				1.43 ±0.25	
		2, 3				1.18 ±0.25	
		4, 4.5				2.18 ±0.25	
		8 – 15				1.18 ±0.25	
		Black				0.5	
	0.75			0.75			
	1			0.65			
	1.5			0.45			
	2			0.35			
	2.5			0.65			
	3			0.55			
	4			0.45			
	5			0.35			
	6			0.32			
	6.5			0.3			
	7			0.27			
	10	0.25					
2010	None	1, 4, 5	5.08	2.54 ±0.15	0.60	1.84 ±0.25	0.04
		2, 6, 7, 8				1.54 ±0.25	
		3				1.04 ±0.25	
		9, 10				1.29 ±0.25	
1206	None	1, 4, 5, 6	3.20	1.6 ±0.10		1.1 ±0.25	0.02
		2, 3, 10				0.6 ±0.25	
		7, 8, 9				0.9 ±0.25	



Flammability

The resistor will not burn or emit incandescent particles under any condition of applied temperature or overload.

Solvent resistance

The body protection and marking are resistant to all normal industrial solvents suitable for printed circuits.

Packaging

ULR parts are packed on a 2000 piece reel. Tape width is 8mm for 1206 and 12mm for 2010 and 2512.

Ordering Procedure

Example: ULR1 at 2.5 milliohms and 1% tolerance on reel of 2000 pieces:

ULR1-R0025FT2

Type _____

Value (use IEC62 code) _____

Tolerance (use IEC62 code) _____

F	1%
J	5%

Packing _____

T2	Tape	1206, 2010, 2512	2000 / reel	Standard
T1			1000 / reel	

General Note

TT electronics reserves the right to make changes in product specification without notice or liability.
All information is subject to TT electronics' own data and is considered accurate at time of going to print.