

## SMD - Resistors

Product: Ultra Low Ohm (Metal Strip) Chip Resistor -SMDU Series

Size: 1206/2010/2512



official distributor of



## SMD - Resistors

### Ultra Low Ohm (Metal Strip) Chip Resistor (SMDU Series)

#### ► 1. Scope

- This specification applies to all sizes of rectangular-type fixed chip resistors with alloy as mater.

#### ► 2. Features

- High power rating up to 3 Watts
- Low TCR down to  $\pm 50$  PPM/ $^{\circ}$ C
- Resistance values from 0.5 to 15m ohm
- Customized resistance available
- Wide range package sizes 1206 / 2010 / 2512

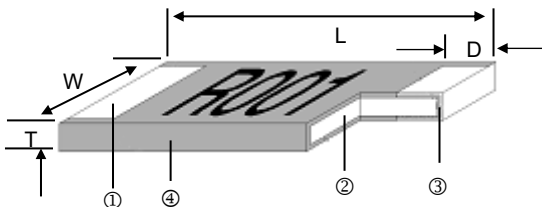


#### ► 3. Applications

- NB (for Power Management)
- MB (for Power Management)
- SWPS (DC-DC Converter, Charger, Adaptor)
- Monitor (for Power Management)

#### ► 4. Construction

2512

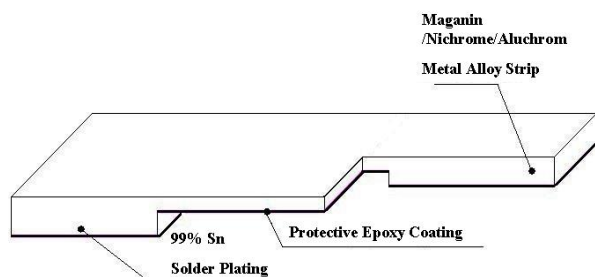


Black - Wave or IR reflow soldering

① Solder Plating (Sn)	③ Barrier Layer (Ni)
② Alloy Plate	④ Overcoat

## SMD - Resistors

1206 & 2010



Type	Material
R001~ R003	Manganese, Copper
R004 ~ R010	Aluminum, Iron, Copper

### ► 5. Dimensions

Unit: mm

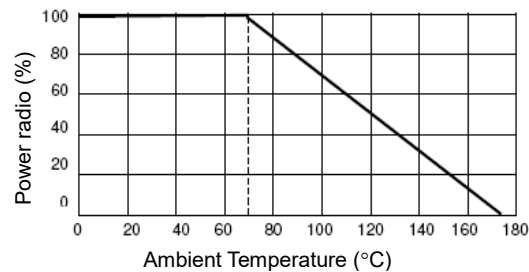
Part No.	Resistance (mΩ)	L	W	T	D	Weight (g) (1000pcs)
SMDU1206□T□□□□□	1.0 - 10	3.20±0.254	1.60±0.104	0.60±0.20	0.980±0.380	22.6
SMDU2010□T□□□□□	1.0 - 10	5.08±0.254	2.54±0.15	0.60±0.20	1.665±0.625	42.3
SMDU2512□T□0M50	0.50	6.35±0.254	3.18±0.254	1.40±0.20	1.425±0.377	61.03
SMDU2512□T□0M75	0.75	6.35±0.254	3.18±0.254	1.00±0.20	1.425±0.377	61.03
SMDU2512□T□R001	1.00	6.35±0.254	3.18±0.254	0.80±0.20	1.425±0.377	61.03
SMDU2512□T□1M50	1.50	6.35±0.254	3.18±0.254	0.65±0.20	1.425±0.377	61.03
SMDU2512□T□R002	2.00	6.35±0.254	3.18±0.254	0.50±0.20	1.425±0.377	61.03
SMDU2512□T□2M50	2.50	6.35±0.254	3.18±0.254	1.00±0.20	1.425±0.377	61.03
SMDU2512□T□R003	3.00	6.35±0.254	3.18±0.254	0.70±0.20	1.425±0.377	61.03
SMDU2512□T□R004	4.00	6.35±0.254	3.18±0.254	0.60±0.20	1.425±0.377	61.03
SMDU2512□T□R005	5.00	6.35±0.254	3.18±0.254	0.50±0.20	1.425±0.377	61.03
SMDU2512□T□R006	6.00	6.35±0.254	3.18±0.254	0.50±0.20	1.425±0.377	61.03
SMDU2512□T□6M50	6.50	6.35±0.254	3.18±0.254	0.45±0.20	1.425±0.377	61.03
SMDU2512□T□R007	7.00	6.35±0.254	3.18±0.254	0.45±0.20	1.425±0.377	61.03

## SMD - Resistors

### 6. Part Numbering

SMDU	2512	J	T	E	S	R002	G
Product Type	Dimensions (L×W)	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Power Rating	Resistance	Marking
	1206 2010 2512	F: ±1% H: ±3% J: ±5%	T: Taping Reel	D: ±50 E: ±100 K: ±150 W: ±75	: Standard A: 1.5W B: 2.5W R: 3W S: 2W	R002: 0.002Ω R020: 0.02Ω 0M50: 0.0005Ω 1M50: 0.0015Ω	: Black Coating  **2010/1206 No coating / marking

### 7. Derating Curve



### 8. Standard Electrical Specifications

Part No.	Item	Power Rating at 80°C	Operating Temp. Range	Resistance Range (mΩ)			TCR (PPM/°C)
				±1%	±3%	±5%	
SMDU1206□TD□□□□		1W	-55°C ~ +170°C	1.0 - 10.0			±50
SMDU2512□TD□□□□		1W		0.5 - 2.0			±50
SMDU2512□TK□□□□		1W		2.5 - 3.5			±150
SMDU2512□TE□□□□		1W		4.0 - 5.5			±100
SMDU2512□TW□□□□		1W		6.0 - 7.0			±75

Operating Current= $\sqrt{P/R}$ , Operating Voltage= $\sqrt{P \cdot R}$

#### 8.1 High Power Rating Electrical Specifications

Part No.	Item	Power Rating at 80°C	Operating Temp. Range	Resistance Range (mΩ)			TCR (PPM/°C)
				±1%	±3%	±5%	
SMDU2010□TDA□□□□		1.5W	-55°C ~ +170°C	1.0 - 10.0			±50
SMDU2512□TDS□□□□		2W		0.5 - 2.0			±50

Operating Current = $\sqrt{P/R}$ , Operating Voltage= $\sqrt{P \cdot R}$

electronic sensor + resistor has the ability of manufacture following options based on customer's requirement.

## SMD - Resistors

### ► 9. Resistance codes example

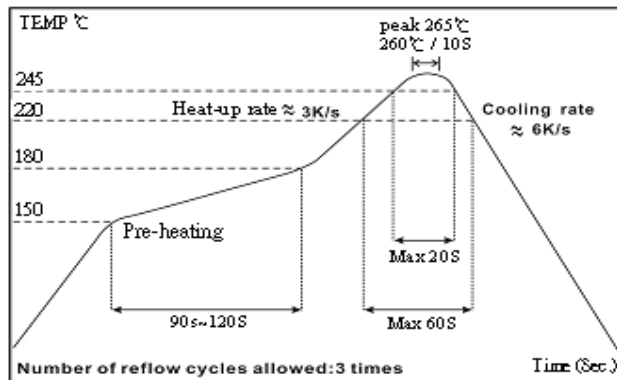
Resistance (3Marking)

Resistance	0.5mΩ	0.75mΩ
Codes	M50	M75

Resistance (4Marking)

Resistance	1mΩ	1.5mΩ	2mΩ	7mΩ	10
Codes	R001	1M50	R002	R007	R010

### ► 10. Reflow



### ► 11. Environmental Characteristics

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	MIL-STD-202F Method 304 +25/-55/+25/+125/+25°C
Short Time Overload	$\pm 0.5\%$	JIS-C-5201-1 5.5 5*rated power for 5 seconds
Endurance	$\pm 1\%$	MIL-STD-202F Method 108A 70 $\pm 2^\circ\text{C}$ , Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Dry Heat	$\pm 1\%$	JIS-C-5201-1 7.2 at +170°C for 1000 hrs
Solderability	95% min. coverage	MIL-STD-202F Method 208H 245 $\pm 5^\circ\text{C}$ for 3 seconds
Resistance to Soldering Heat	$\pm 0.5\%$	MIL-STD-202F Method 210E 260 $\pm 5^\circ\text{C}$ for 10 seconds
Thermal Shock	$\pm 0.5\%$	MIL-STD-202F Method 107G -55°C ~ 150°C, 100 cycles

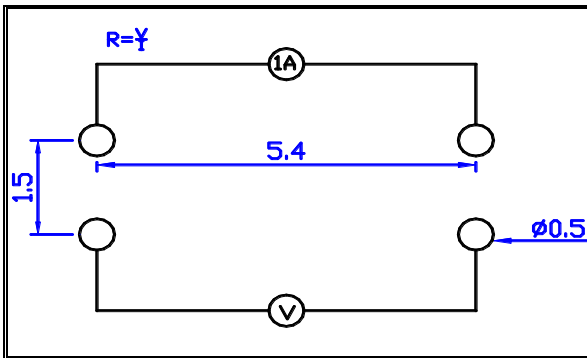
■ Storage Temperature: 25 $\pm 3^\circ\text{C}$ ; Humidity < 80%RH

## SMD - Resistors

### ► 12. Measurements

#### 1. SMDU2512 4-wire precision measurement

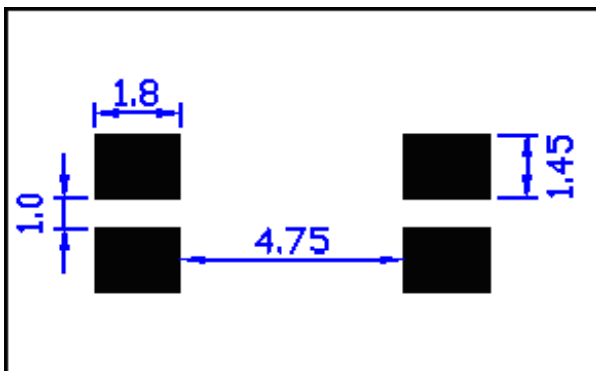
- Equipment: ADEX AX-1152D DC Low Ohm Meter
- Excitation Current: 3A (0.5mΩ~1.5 mΩ)  
1A (2mΩ~7mΩ)



Unit: mm

#### 2. SMDU2512 4-wire pad layout (recommended for precision current sensing)

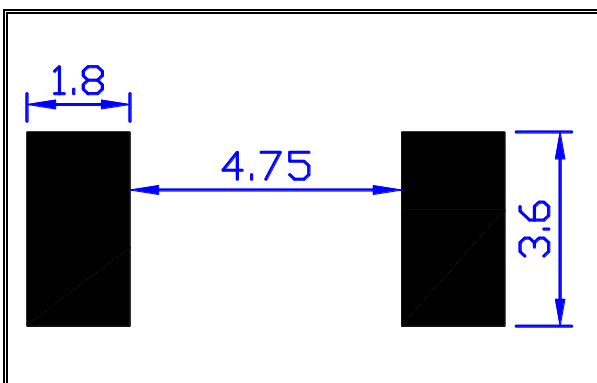
- Note: No circuits between pads to avoid short circuit



Unit: mm

#### 3. SMDU2512 2-wire pad layout

- Note: No circuits between pads to avoid short circuit



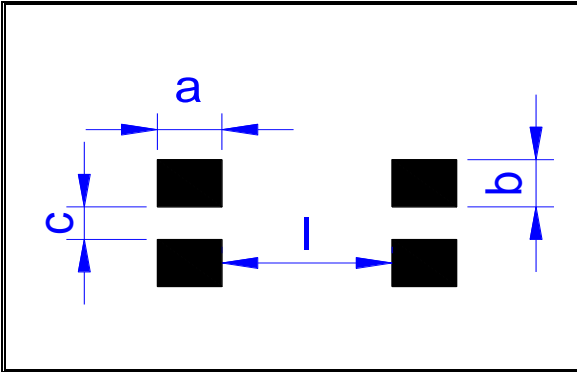
Unit: mm

## SMD - Resistors

### 5. SMDU2512 4-wire pad layout (recommended for precision current sensing)

■ Note: No circuits between pads to avoid short circuit

Unit: mm

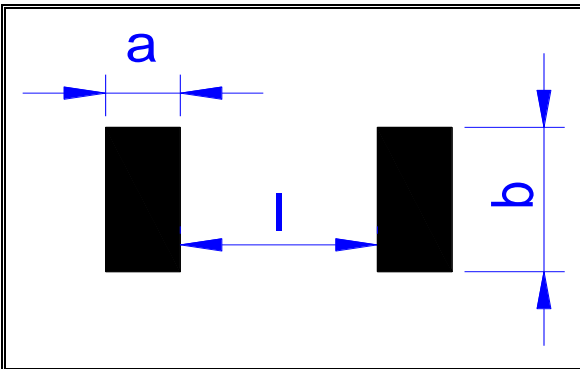


Type	Item	a m/m	b m/m	C m/m	l m/m
M50		2.78	1.2	1.0	0.9
M75		2.58	1.2	1.0	1.3
R001		2.03	1.2	1.0	2.4
1M5		1.53	1.2	1.0	3.4
R002~R003		1.28	1.2	1.0	3.9
R004		2.28	1.2	1.0	1.9
R005~R006		2.03	1.2	1.0	2.4
R007		1.53	1.2	1.0	3.4
R008~R015		1.28	1.2	1.0	3.9

### 6. SMDU2512 2-wire pad layout

■ Note: No circuits between pads to avoid short circuit

Unit: mm

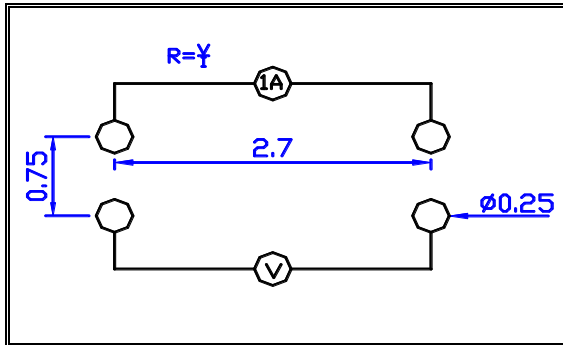


Type	Item	a m/m	b m/m	l m/m
M50		2.78	3.4	0.9
M75		2.58	3.4	1.3
R001		2.03	3.4	2.4
1M5		1.53	3.4	3.4
R002~R003		1.28	3.4	3.9
R004		2.28	3.4	1.9
R005~R006		2.03	3.4	2.4
R007		1.53	3.4	3.4
R008~R015		1.28	3.4	3.9

## SMD - Resistors

### 7. SMDU1206 4-wire precision measurement

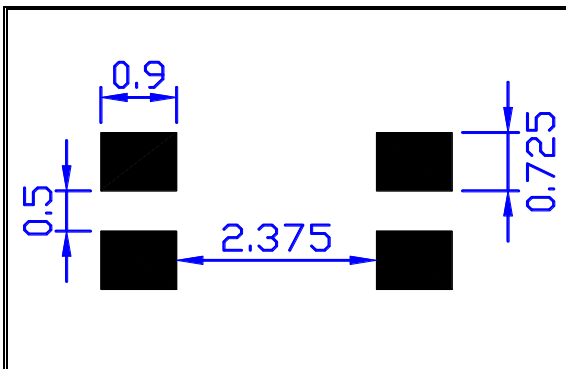
- Equipment: ADEX AX-1152D DC Low Ohm Meter
- Excitation Current: 1A (1mΩ~10mΩ)



Unit: mm

### 8. SMDU1206 4-wire pad layout (recommended for precision current sensing)

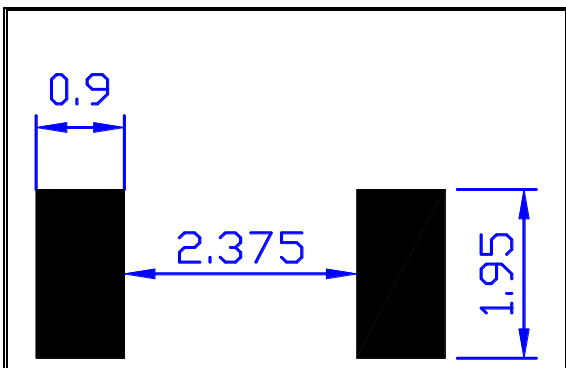
- Note: No circuits between pads to avoid short circuit



Unit: mm

### 9. SMDU1206 2-wire pad layout

- Note: No circuits between pads to avoid short circuit



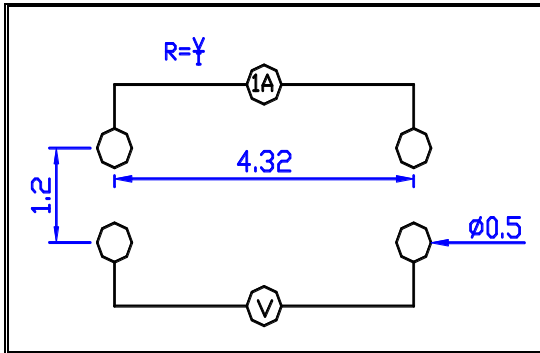
Unit: mm



## SMD - Resistors

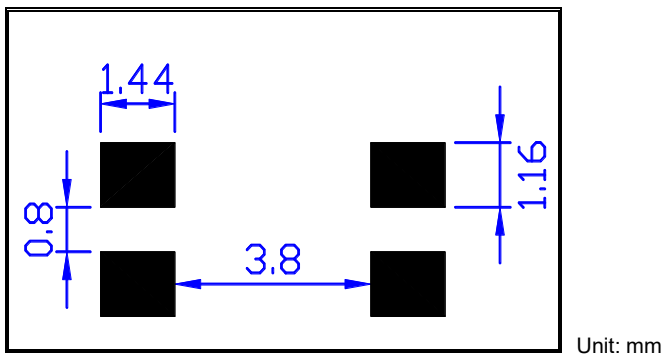
### 10. SMDU2010 4-wire precision measurement

- Equipment: ADEX AX-1152D DC Low Ohm Meter
- Excitation Current: 1A (1mΩ~10mΩ)



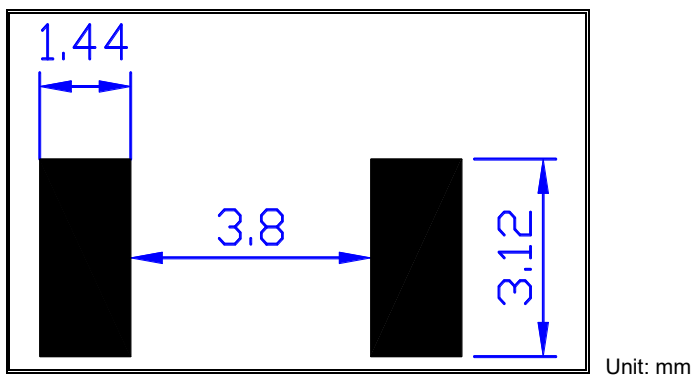
### 11. SMDU2010 4-wire pad layout (recommended for precision current sensing)

- Note: No circuits between pads to avoid short circuit



### 12. SMDU2010 2-wire pad layout

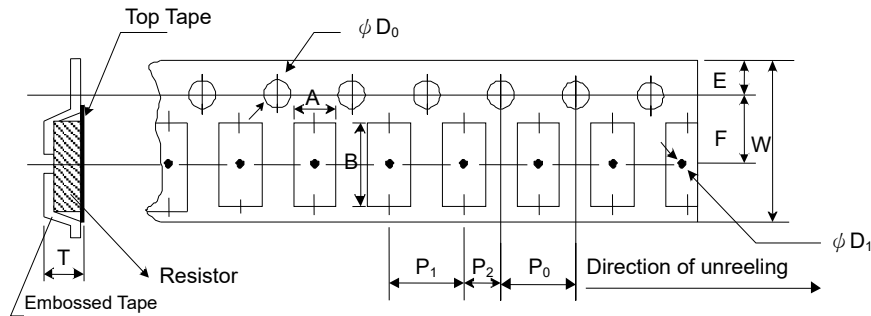
- Note: No circuits between pads to avoid short circuit



## SMD - Resistors

### ► 13. Packaging

#### Embossed Plastic Tape Specifications



Unit: mm

Type	Resistance (mΩ)	A	B	W	E	F	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	ΦD <sub>0</sub>	ΦD <sub>1</sub>	T	Quantity (EA)
SMDU1206	1 - 10	1.90±0.1	3.60±0.1	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	4.00±0.1	2.0±0.05	1.55±0.05	1.0min.	0.87±0.1	2000
SMDU2010	1 - 10	2.85±0.1	5.55±0.1	12.0±0.2	1.75±0.1	5.5±0.05	4.0±0.1	4.00±0.1	2.0±0.05	1.55±0.05	1.4min.	0.85±0.1	2000
SMDU2512	0.50 - 7	3.40±0.1	6.73±0.1	12.0±0.1	1.75±0.1	5.5±0.05	4.0±0.1	4.00±0.1	2.0±0.05	1.50±0.10	1.4min.	0.81±0.1	2000
	0.50 - 15	3.40±0.1	6.75±0.1	12.0±0.1	1.75±0.1	5.5±0.05	4.0±0.1	4.00±0.1	2.0±0.05	1.55±0.05	1.4min.	0.80±0.1	2000

1. The cumulative tolerance of 10 sprockets hole pitch is  $\pm 0.2$ mm.
2. Carrier camber shall be not more than 1mm per 100mm through a length of 250mm.
3. A & B measured 0.3mm from the bottom of the packet
4. T measured at a point on the inside bottom of the packet to the top surface of the carrier.
5. Pocket position relative to sprocket hole is measured as the true position of the pocket and not the pocket hole.