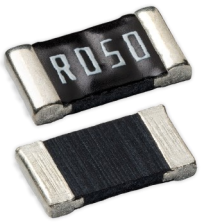
Thin Film Technology Corp.

Product Family: 2-Terminal Low-Ohm Current Sense Resistors

Part Number Series: WLM Series

RoHS COMPLIANT 2011/65/EU

HF HALOGEN-FREE



Construction:

- Metal alloy plate
- Epoxy-resin overcoat
- 100% matte tin over Ni terminations
- Halogen Free
- RoHS compliant and Pb free
- Inherently Anti-Sulfur

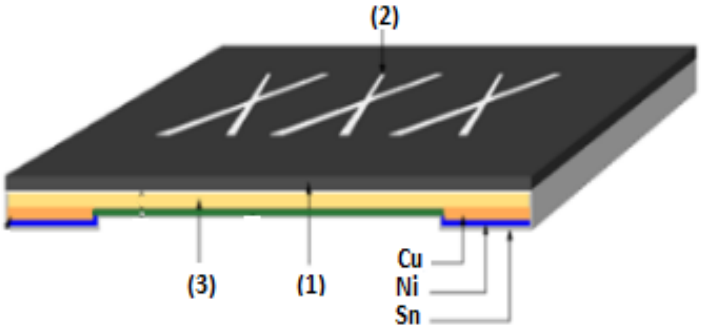
Features:

- 0805, 1206, 2512, 2725, 2728, 4527 English case sizes
- Power up to 5W
- Resistance from 0.25mΩ~500mΩ + Jumpers available
- TCR down ±50ppm/°C
- Tolerance down to ±0.5%
- Moisture Sensitivity Level (MSL) = 1

Description:

These low ohm metal alloy current sense resistors are designed for tight resistance tolerance, low TCR, and long term stability. This series is ideal for use in battery management systems, measuring instruments, entertainment products, power supply, and industrial applications.

Product Construction:



Number	Description
1	Protection Coating (epoxy resin)
2	Marking
3	Metal alloy plate

Part Numbering: Ex: WLM2725S4W00M50F-T2

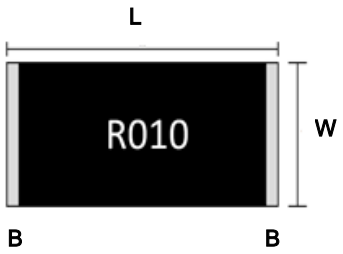
Series Name	English Size (Metric Size)	Metal Alloy	Power Code	Resistance Value	Resistance Tolerance	T&R Packaging Quantity
WLM	**0805** (2012) **1206** (3216) **2512** (6432) **2725** (6963) **2728** (6967) **4527** (11470)	**S** = MnCuSn **M** = MnCu **F** = FeCrAl **C** = Cu	**W50** = 1/2W **W75** = 3/4W **1W0** = 1W **2W0** = 2W **3W0** = 3W **4W0** = 4W **5W0** = 5W (refer to tables)	Use 4 digit code for all case sizes. "R" denotes decimal point as necessary. Ex: **R001** = 0.001Ω ***0M50** = 0.0005Ω **JUMP** = < 0.2mΩ (refer to tables)	**D** = ±0.5% ****F** = ±1.0% **G** = ±2.0% **J** = ±5.0% (refer to tables)	**-T1** = 1,000 pcs/reel **-T2** = 2,000 pcs/reel **-T4** = 4,000 pcs/reel **-T5** = 5,000 pcs/reel (refer to tables)

Note: *For resistance values less than one milliohm or those with 1/2 milliohm increments, use "M" to specify the decimal point (i.e. 0M50=0.0005Ω and 7M50 = 7.50mΩ). For jumpers, ≤0.2mΩ, use "JUMP" code.

** All jumpers ≤ 0.2mΩ are coded with "F" as the resistance tolerance.

Product Dimensions:

Top



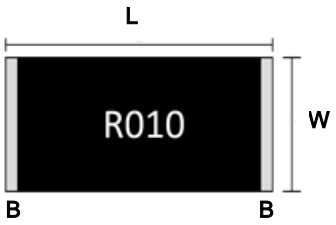
Side

All dimensions shown in inches, mm in parenthesis.

Dimensions (Metric)	Resistance Range	L	W	H	B	A
WLM0805 (2012)	0.5mΩ	0.081 ±0.010 (2.05 ±0.25)	0.051 ±0.012 (1.30 ±0.30)	0.024 ±0.008 (0.60 ±0.20)	–	0.030 ±0.008 (0.75 ±0.20)
	1mΩ			0.022 ±0.008 (0.55 ±0.20)		0.016 ±0.008 (0.40 ±0.20)
	1.5mΩ			0.018±0.008 (0.45 ±0.20)		
	2mΩ			0.014 ±0.008 (0.35 ±0.20)		
	2.5mΩ			0.018 ±0.008 (0.45 ±0.20)		
	3~8mΩ			0.014 ±0.008 (0.35 ±0.20)		
	9~13mΩ			0.015 ±0.008 (0.37 ±0.20)		
	14~15mΩ			0.013 ±0.008 (0.32 ±0.20)		
WLM1206 (3216)	1mΩ	0.126 ±0.010 (3.20 ±0.25)	0.065 ±0.010 (1.65 ±0.25)	0.032 ±0.010 (0.82 ±0.25)	0.020 ±0.010 (0.51 ±0.25)	0.020 ±0.010 (0.51 ±0.25)
	2mΩ			0.028 ±0.010 (0.70 ±0.25)		
	3mΩ			0.024 ±0.010 (0.60 ±0.25)		
	4~20mΩ			0.022 ±0.010 (0.55 ±0.25)		
	21~50mΩ			0.019 ±0.010 (0.47 ±0.25)		
	51~75mΩ			0.016 ±0.010 (0.40 ±0.25)		
	1mΩ			0.032 ±0.010 (0.82 ±0.25)		
	2mΩ			0.028 ±0.010 (0.70 ±0.25)		
	3mΩ			0.024 ±0.010 (0.60 ±0.25)		
	4~20mΩ			0.022 ±0.010 (0.55 ±0.25)		
	21~50mΩ			0.019 ±0.010 (0.47 ±0.25)		
	1mΩ			0.032 ±0.010 (0.82 ±0.25)		
	2mΩ			0.028 ±0.010 (0.70± 0.25)		
	3mΩ			0.024 ±0.010 (0.60 ±0.25)		
	4~10mΩ			0.022 ±0.010 (0.55 ±0.25)		

Product Dimensions (Cont.):

Top



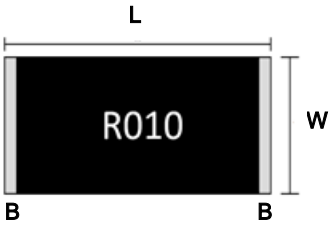
Side

All dimensions shown in inches, mm in parenthesis.

Dimensions (Metric)	Resistance Range	L	W	H	B	A
WLM2512 (6432)	0.5mΩ	0.250 ±0.010 (6.35 ±0.25)	0.120 ±0.010 (3.05 ±0.25)	0.032 ±0.010 (0.82 ±0.25)	0.078 ±0.010 (1.98 ±0.25)	0.079 ±0.010 (2.00 ±0.25)
	0.75mΩ			0.028 ±0.010 (0.70 ±0.25)	0.045 ±0.010 (1.15 ±0.25)	0.078 ±0.010 (1.98 ±0.25)
	1mΩ			0.028 ±0.010 (0.72 ±0.25)		0.087 ±0.010 (2.20 ±0.25)
	1.5mΩ					0.055 ±0.010 (1.40 ±0.25)
	2~5mΩ					0.045 ±0.010 (1.15 ±0.25)
	6mΩ			0.022 ±0.010 (0.55 ±0.25)		0.043 ±0.010 (1.10 ±0.25)
	7~10mΩ			0.024 ±0.010 (0.60 ±0.25)		
	11~75mΩ				0.041 ±0.010 (1.05 ±0.25)	
	76~100mΩ			0.022 ±0.010 (0.55 ±0.25)	0.030 ±0.010 (0.75 ±0.25)	
	101~135mΩ			0.019 ±0.010 (0.47 ±0.25)		
	136~200mΩ			0.016 ±0.010 (0.40 ±0.25)		
	201~450mΩ					0.033 ±0.010 (0.85 ±0.25)
	451~500mΩ			0.014 ±0.010 (0.35 ±0.25)		
	0.5mΩ			0.032 ±0.010 (0.82 ±0.25)	0.078 ±0.010 (1.98 ±0.25)	0.079 ±0.010 (2.00 ±0.25)
	0.75mΩ			0.028 ±0.010 (0.70 ±0.25)	0.045 ±0.010 (1.15 ±0.25)	0.078 ±0.010 (1.98 ±0.25)
	1mΩ			0.028 ±0.010 (0.72 ±0.25)		0.087 ±0.010 (2.20 ±0.25)
	1.5mΩ					0.055 ±0.010 (1.40 ±0.25)
	2~5mΩ					0.045 ±0.010 (1.15 ±0.25)
	6mΩ			0.022 ±0.010 (0.55 ±0.25)	0.030 ±0.010 (0.75 ±0.25)	0.043 ±0.010 (1.10 ±0.25)
	7~10mΩ			0.024 ±0.010 (0.60 ±0.25)	0.045 ±0.010 (1.15 ±0.25)	
	11~75mΩ				0.030 ±0.010 (0.75 ±0.25)	
	76~100mΩ			0.022 ±0.010 (0.55 ±0.25)		

Product Dimensions (Cont.):

Top



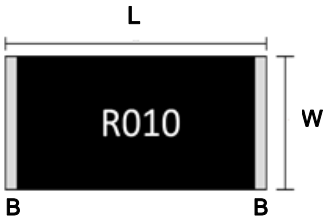
Side

All dimensions shown in inches, mm in parenthesis.

Dimensions (Metric)	Resistance Range	L	W	H	B	A
WLM2725 (6963)	0.2mΩ	0.272 ±0.010 (6.90 ±0.25)	0.250 ±0.010 (6.35 ±0.25)	0.043 ±0.010 (1.10 ±0.25)	0.047 ±0.010 (1.20 ±0.25)	0.085 ±0.010 (2.15±0.25)
	0.25mΩ			0.037 ±0.010 (0.95 ±0.25)		0.090 ±0.010 (2.29 ±0.25)
	0.3mΩ					0.078 ±0.010 (1.98 ±0.25)
	0.35mΩ					0.067 ±0.010 (1.71 ±0.25)
	0.4mΩ					0.057 ±0.010 (1.44 ±0.25)
	0.5mΩ			0.033 ±0.010 (0.85 ±0.25)		0.082 ±0.010 (2.08 ±0.25)
	0.6mΩ					0.070 ±0.010 (1.78 ±0.25)
	0.8mΩ					0.051 ±0.010 (1.30 ±0.25)
	1mΩ	0.339 ±0.010 (6.80 ±0.25)		0.026 ±0.010 (0.65 ±0.25)	0.045 ±0.010 (1.15 ±0.25)	0.071 ±0.010 (1.80 ±0.25)
	1.5~1.6mΩ					0.059 ±0.010 (1.50 ±0.25)
	2~3mΩ			0.022 ±0.010 (0.55 ±0.25)		
WLM2728 (6967)	4~450mΩ	0.260 ±0.010 (6.60 ±0.25)	0.264 ±0.010 (6.70 ±0.25)	0.023 ±0.010 (0.58 ±0.25)	0.016 ±0.010 (0.40 ±0.25)	0.041 ±0.010 (1.05 ±0.25)
WLM4527 (11470)	0.5mΩ	0.445 ±0.020 (11.3 ± 0.50)	0.260 ±0.020 (6.60 ±0.50)	0.030 ±0.010 (0.77 ±0.25)	0.035 ±0.010 (0.90 ±0.25)	0.118 ±0.010 (3.00 ±0.25)
	1mΩ			0.026 ±0.010 (0.65 ±0.25)		
	1.5~20mΩ					0.079 ±0.010 (2.00 ±0.25)
	21~100mΩ			0.022 ±0.010 (0.55 ±0.25)		
	0.5mΩ			0.030 ±0.010 (0.77 ±0.25)		0.118 ±0.010 (3.00 ±0.25)
	1mΩ			0.026 ±0.010 (0.65 ±0.25)		
	1.5~20mΩ					0.079 ±0.010 (2.00 ±0.25)
	21~60mΩ			0.022 ±0.010 (0.55 ±0.25)		
	0.5mΩ			0.031 ±0.010 (0.80 ±0.25)	0.026 ±0.010 (0.65 ±0.25)	0.118 ±0.010 (3.00 ±0.25)
	1mΩ			0.027 ±0.010 (0.68 ±0.25)		
	1.5~20mΩ					0.079 ±0.010 (2.00 ±0.25)
	21~500mΩ			0.023 ±0.010 (0.58 ±0.25)		

Jumper Dimensions:

Top



Side

All dimensions shown in inches, mm in parenthesis.

Dimensions (Metric)	Resistance Range	L	W	H	B	A
WLM0805 (2012)	≤0.2mΩ	0.081 ±0.010 (2.05 ±0.25)	0.051 ±0.012 (1.30 ±0.30)	0.018 ±0.008 (0.45 ±0.20)	-	0.016 ±0.008 (0.40 ±0.20)
WLM1206 (3216)	≤0.2mΩ	0.126 ±0.010 (3.20 ±0.25)	0.065 ±0.010 (1.65 ±0.25)	0.026 ±0.010 (0.65 ±0.25)	0.020 ±0.010 (0.51 ±0.25)	0.020 ±0.010 (0.51 ±0.25)
WLM2512 (6432)	≤0.2mΩ	0.250 ±0.010 (6.35 ±0.25)	0.120 ±0.010 (3.05 ±0.25)	0.026 ±0.010 (0.65 ±0.25)	0.045 ±0.010 (1.15 ±0.25)	0.043 ±0.010 (1.10 ±0.25)

Electrical Specifications:

Type		WLM0805						WLM1206			
Power Rating		1/2W (0.5W)			1W			1/2W (0.5W)	3/4W (0.75W)	1W	1 ½W (1.5W)
TCR ±ppm/°C		±100	±75	±50	±100	±75	±50	±50			
Max. Rating Current		31.62A	18.26A	14.14A	44.72A	25.81A	20.0A	22.36A	27.38A	31.62A	38.72A
Max. Overload Current		70.71A	40.82A	31.62A	89.44A	51.63A	40.0A	50.0A	61.23A	70.71A	86.60A
Resistance Range (mΩ)	0.5%(D)	-	-	7~15	-	-	7~15	5~75		5~50	5~10
	1.0%(F) 2.0%(G) 5.0%(J)	0.5~1	1.5~2	2.5~15	0.5~1	1.5~2	2.5~15	1~75		1~50	1~10
Material (Code)		0.5mΩ~2mΩ(S) 2.5mΩ~8mΩ(M) 9mΩ~13mΩ(F)						1mΩ(S) 2mΩ~7mΩ(M) 8mΩ~75mΩ(F)		1mΩ(S) 2mΩ~7mΩ(M) 8mΩ~50mΩ(F)	1mΩ(S) 2mΩ~7mΩ(M) 8mΩ~10mΩ(F)
Operating Temp. Range		-55°C~+170°C									
Rated Voltage		√ (Power x Resistance)									
Packaging (code)		5,000pcs/reel (-T5)*									

*Note: 1206 case size resistance value R001, 1mΩ packaging quantity is 4,000 (-T4) pcs/reel.

Electrical Specifications (Cont.):

Type		WLM2512					
Power Rating		1W		2W		3W	
TCR ±ppm/°C		≤±50	≤±75	≤±50	≤±75	≤±50	≤±75
Max. Rating Current		31.62A	44.72A	44.72A	63.24A	54.77A	77.45A
Max. Overload Current		70.71A	100.00A	100.00A	141.42A	122.47A	173.20A
Resistance Range (mΩ)	0.5%(D)	3~450	-	3~450	-	3~100	-
	1.0%(F) 2.0%(G) 5.0%(J)	1~500	0.5~0.80	1~450	0.5~0.80	1~100	0.5~0.80
Material (code)		1mΩ~6mΩ(M) 7mΩ~4500mΩ(F)	0.5mΩ~ 0.75mΩ(S)	1mΩ~6mΩ(M) 7mΩ~450mΩ(F)	0.5mΩ~ 0.75mΩ(S)	1mΩ~6mΩ(M) 7mΩ~100mΩ(F)	0.5mΩ~ 0.75mΩ(S)
Operating Temp. Range		-55°C~+170°C					
Rated Voltage		$\sqrt{\text{(Power x Resistance)}}$					
Packaging (code)		4,000pcs/reel (-T4)					

Type		WLM2725		WLM2728
Power Rating		4W		4W
TCR ±ppm/°C		±50	±100	±50
Max. Rating Current		126.49A	141.42A	31.62A
Max. Overload Current		252.98A	282.84A	63.24A
Resistance Range (mΩ)	0.5%(D)	-	-	7~450
	1.0%(F) 2.0%(G) 5.0%(J)	0.25~3	0.2	4~450
Material (Code)		0.2mΩ~0.4mΩ(S) 0.5mΩ~0.25mΩ(M) 3mΩ(F)	0.2mΩ(S)	4mΩ~450mΩ(F)
Operating Temp. Range		-55°C~+170°C		
Rated Voltage		$\sqrt{\text{(Power x Resistance)}}$		
Packaging (code)		1,000pcs/reel (-T1) , 2,000 pcs/reel (-T2)*		2,000pcs/reel (-T2)

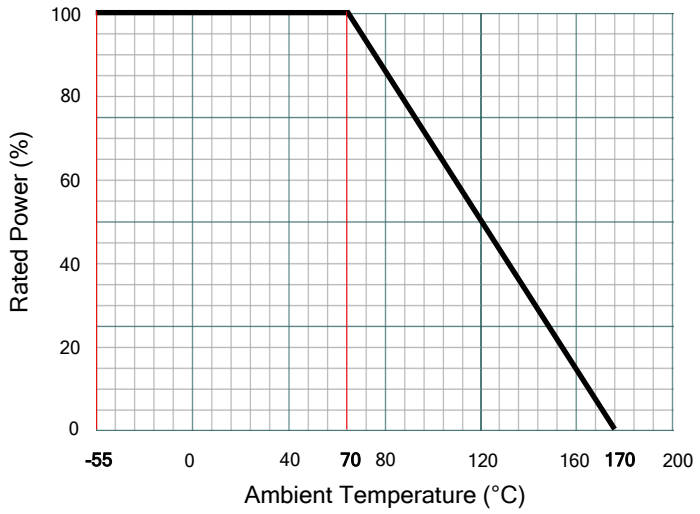
*Note: 2725 case size resistance value R≤1Ω is 1,000pcs/reel (-T1), R≥ 1Ω packaging quantity is 2,000pcs/reel (-T2).

Type		WLM4527					
Power Rating		2W		3W		5W	
TCR ±ppm/°C		±50	±75	±50	±75	±50	±75
Max. Rating Current		44.72A	63.24A	54.77A	77.45A	70.71A	100.00A
Max. Overload Current		100.00A	141.42A	122.47A	173.20A	122.47A	173.20A
Resistance Range (mΩ)	0.5%(D)	5~100	-	5~60	-	5~500	-
	1.0%(F) 2.0%(G) 5.0%(J)	1~100	0.5	1~60	0.5	1~500	0.5
Material (Code)		1mΩ~40mΩ(M) 41Ω~100mΩ(F)	0.5mΩ(S)	1mΩ~40mΩ(M) 41mΩ~60mΩ(F)	0.5mΩ(S)	1mΩ~40mΩ(M) 41mΩ~500mΩ(F)	0.5mΩ(S)
Operating Temp. Range		-55°C~+170°C					
Rated Voltage		$\sqrt{\text{(Power x Resistance)}}$					
Packaging (code)		1,000pcs/reel (-T1)					

Jumper Specifications:

Type	Power Rating at 70° C	Max. Rating Current	Resistance (mΩ)	Material	Operating Temp. Range	Packaging (code)
WLM0805	0.50W	50A	≤0.20	Jumper = (C)	-55°C~+170°C	5,000pcs/reel (-T5)
	1.0W	70.7A				
WLM1206	1.0W	70.7A				
WLM2512	2.0W	100A				4,000pcs/reel (-T4)
	3.0W	122A				

Power Derating Curve:



Reliability Specifications:

Test	Procedure	Specification
Temperature Coefficient of Resistance (TCR) JIS C 5201-1 4.8 IEC-60115-1 4.8	At 25°C/±150 °C, 25°C is the reference temperature	As Spec
Short Time Overload JIS C 5201-1 4.13 IEC-60115-1 4.13	The number of rated power are as follows: • WLM0805-1/2W: 5 times of rated power • WLM0805-1W: 4 times of rated power • WLM1206-1/2W: 5 times of rated power • WLM1206-3/4W: 5 times of rated power • WLM1206-1W: 5 times of rated power • WLM1206-1.5W: 5 times of rated power • WLM2512-1W, 2W: 5 times of rated power • WLM2512-3W: 5 times of rated power • WLM2725-4W: 4 times of rated power • WLM2728-4W: 4 times of rated power • WLM4527-2W, 3W: 5 times of rated power • WLM4527-5W: 3 times of rated power Rating power duration: 5secs	WLM0805: ΔR/R1≤±1.0% WLM4527: ΔR/R1≤±2.0% The others: ΔR/R1≤±0.5%
High Temperature Exposure MIL-STD-202 Method 108	1,000hrs at +170°C, unpowered Measurement at 24 ±4 hours after test conclusion	WLM4527: ΔR/R1≤±2.0% The others: ΔR/R1≤±1.0%
Resistance to Soldering Heat JIS C 5201-1 4.18 IEC-60115-1 4.18	260 ±5°C for 10 seconds.	ΔR/R1≤±0.5%
Temperature Cycling JESD22 Method JA-104	1000 Cycles (-55°C to +155°C) Measurement at 24±4 hours after test conclusion. 30min maximum dwell time at each temperature extreme	ΔR/R1≤±0.5%
Biased Humidity MIL-STD-202 Method 103	1,000hrs; 85°C/85%RH, 10% of operating power. Measurement at 24±4 hours after test conclusion.	ΔR/R1≤±0.5%
Load Life (Endurance) JIS-C-5201-1 4.25 IEC-60115-1 4.25.1	70±2° C, RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs〝ON〞and 0.5 hr〝OFF〞.	WLM4527: ΔR/R1≤±2.0% The others: ΔR/R1≤±1.0%
Solderability J-STD-002 JIS C 5201-1 4.17 IEC-60115-1 4.17	0805: 4 hours 155°C dry heat, then 245 ±5°C for 3 secs. 1206-4527: 245 ±5°C for 3 secs	>95% coverage

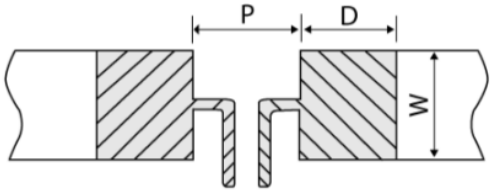
Reliability Specifications (Cont.):

Test	Procedure	Specification
Dielectric Withstanding Voltage JIS-C5201-1 4.7	Applied 500VAC for 1 minute, and limit surge current 50 mA (max.)	No short or burn on the appearance.
Board Flex AEC Q200-005	0805: Bending once for 60 secs, 2mm 1206~4527: Bending once 2mm for 10 secs	ΔR/R1≤±0.5% Not broken
Core Body Strength JIS-C5201-1 4.15	1206~4527: Central part pressurizing force：5N, 10 secs	Not broken
Terminal Strength AEC Q200-006	Pressurizing force: 17.7N, 10 seconds	Not broken
Moisture Resistance MIL-STD 202 Method 106	T = 24 hours / Cycle,10 cycles. Steps 7a& 7b not required. Unpowered	0805: ΔR/R1≤±1.0% 1206~4527: ΔR/R1≤± 0.5%

Reliability Testing for Jumper:

Test	Procedure	Specifications
Short Time Overload JIS C 5201-1 4.13 IEC-60115-1 4.13	4 times of rated power, 5secs	≤0.2mΩ
High Temperature Exposure JIS-C5201-1 4.25 IEC 60068-2-2	At 170° C for 1000 hours.	≤0.2mΩ
Temperature Cycling JESD22 Method JA104	1000 Cycles (-55°C to +155°C) Measurement at 24±4 hours after test conclusion. 30min maximum dwell time at each temperature extreme.	≤0.2mΩ
Biased Humidity JIS C 5201-1 4.24	1,000hrs at +85°C/85%RH, 10% of operating power. Measurement at 24 ±4 hours after test conclusion	≤0.2mΩ
Load Life (Endurance) JIS-C-5201-1 4.25 IEC-60115-1 4.25.1	70±2° C, RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs〝ON〞and 0.5 hr〝OFF〞.	≤0.2mΩ
Solderability JIS-C-5201-1 4.17 IEC-60115-1 4.17	245 ±5°C for 2 ±0.5secs	>95% coverage

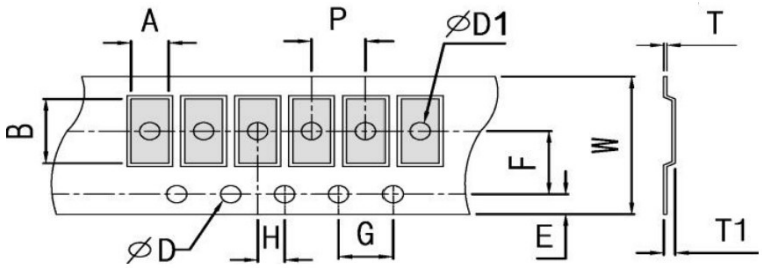
Recommended Land Pattern:



All dimensions in mm.

Type	Resistance Range	P	W	D
WLM0805	0.5mΩ	0.30	1.80	1.35
	Jumper, 1mΩ~13mΩ	1.00	1.80	1.00
WLM1206	Jumper≤0.2mΩ	1.68	2.15	1.46
	1mΩ~75mΩ	1.68	2.15	1.46
WLM2512	Jumper: ≤0.2mΩ	3.15	3.68	2.30
	0.5~1mΩ	1.27	3.68	3.24
	1.5mΩ	1.35	3.68	3.20
	2~5mΩ	2.55	3.68	2.60
	6~200mΩ	3.15	3.68	2.30
	201~450mΩ	3.65	3.68	2.05
WLM2725	0.2~0.35mΩ	1.28	6.70	2.90
	0.4~0.8mΩ	1.70	6.85	3.25
	1~3mΩ	2.70	6.85	2.75
WLM2728	4~450mΩ	3.90	7.20	2.05
WLM4527	0.5~1.5mΩ	4.50	8.74	4.50
	2~100mΩ	6.50	8.74	3.50
	101~500mΩ	6.50	8.74	3.50

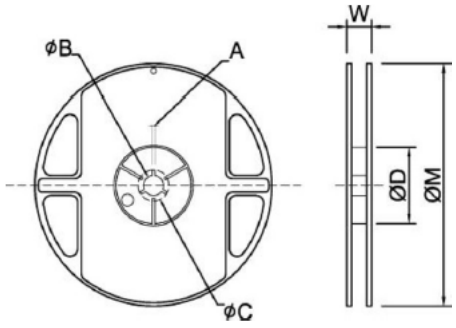
Plastic Tape Dimensions:



All dimensions in mm.

Type	Resistance Range	A	B	ØD	ØD1	E	F	G	H	T	T1	W
WLM0805	0~2.5mΩ	1.70 ±0.10	2.45 ±0.10	1.50 +0.10/-0	1.00 ±0.10	1.75 ±0.10	3.50 ±0.10	4.00 ±0.10	2.00 ±0.10	0.20 ±0.05	0.90 ±0.25	8.00 ±0.30
	3~13mΩ	1.70 ±0.10	2.45 ±0.10	1.50 +0.10/-0	1.00 ±0.10	1.75 ±0.10	3.50 ±0.10	4.00 ±0.10	2.00 ±0.10	0.20 ±0.05	0.55 ±0.25	8.00 ±0.30
WLM1206	1mΩ	2.03 ±0.10	3.55 ±0.10	1.50 +0.10/-0	1.00 ±0.10	1.75 ±0.10	3.50 ±0.10	4.00 ±0.10	2.00 ±0.10	0.20 ±0.05	1.10 ±0.10	8.00 ±0.30
	2~75mΩ	2.03 ±0.10	3.55 ±0.10	1.50 +0.10/-0	1.00 ±0.10	1.75 ±0.10	3.50 ±0.10	4.00 ±0.10	2.00 ±0.10	0.20 ±0.05	0.85 ±0.10	8.00 ±0.30
WLM2512	0.5~2mΩ	3.50 ±0.10	6.75 ±0.10	1.50 +0.10/-0	1.55 ±0.10	1.75 ±0.10	5.50 ±0.10	4.00 ±0.10	2.00 ±0.10	0.20 ±0.05	1.10 ±0.10	12.0 ±0.30
	3~450mΩ	3.50 ±0.10	6.75 ±0.10	1.50 +0.10/-0	1.55 ±0.10	1.75 ±0.10	5.50 ±0.10	4.00 ±0.10	2.00 ±0.10	0.20 ±0.05	0.90 ±0.10	12.0 ±0.30
WLM2725	0.2~0.8mΩ	6.81 ±0.10	7.16 ±0.10	1.50 +0.10/-0	1.55 ±0.10	1.75 ±0.10	5.50 ±0.10	4.00 ±0.10	2.00 ±0.10	0.25 ±0.05	1.30 ±0.10	12.0 ±0.30
	1~3mΩ	6.81 ±0.10	7.16 ±0.10	1.50 +0.10/-0	1.55 ±0.10	1.75 ±0.10	5.50 ±0.10	4.00 ±0.10	2.00 ±0.10	0.25 ±0.05	1.05 ±0.10	12.0 ±0.30
WLM2728	4~450mΩ	7.10 ±0.10	7.05 ±0.10	1.50 +0.10/-0	1.55 ±0.10	1.75 ±0.10	5.50 ±0.10	4.00 ±0.10	2.00 ±0.10	0.20 ±0.05	0.95 ±0.10	12.0 ±0.30
WLM4527	0.5~500mΩ	7.38 ±0.10	12.0 ±0.10	1.50 +0.10/-0	1.50 ±0.10	1.75 ±0.10	11.5 ±0.10	4.00 ±0.10	2.00 ±0.10	0.30 ±0.10	1.05 ±0.10	24.0 ±0.30

Reel Dimensions:

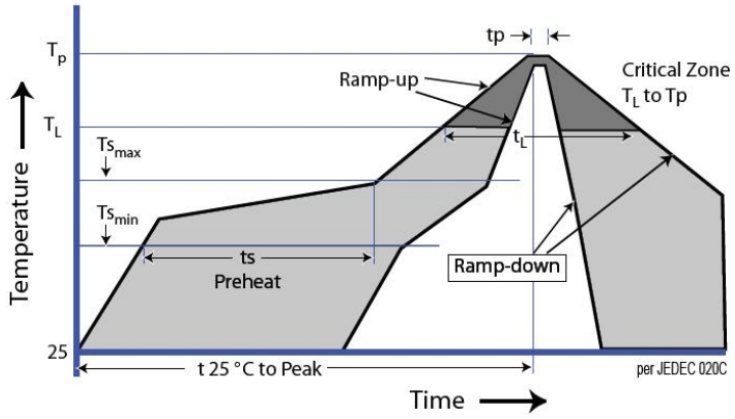


All dimensions in mm.

Size	Quantity	A	ØB	ØC	ØD	W	ØM
WLM0805	5,000 pcs/reel	2.00 ±0.50	13.2 ±0.50	17.7 ±0.50	60.0 ±0.50	12.0 ±0.50	178 ±1.00
WLM1206*	5,000 pcs/reel	2.00 ±0.50	13.2 ±0.50	17.7 ±0.50	60.0 ±0.50	12.0 ±0.50	178 ±1.00
WLM2512	4,000 pcs/reel	2.50 ±0.50	13.5 ±0.50	17.7 ±0.50	60.0 ±0.50	16.2 ±0.50	178 ±1.00
WLM2725	2.000/1,000 pcs/reel	2.50 ±0.50	13.5 ±0.50	17.7 ±0.50	60.0 ±0.50	16.2 ±0.50	178 ±1.00
WLM2728	2,000pcs/reel	2.50 ±0.50	13.5 ±0.50	17.7 ±0.50	60.0 ±0.50	16.2 ±0.50	178 ±1.00
WLM4527	1,000 pcs/reel	2.00 ±0.50	13.2 ±0.50	17.7 ±0.50	60.0 ±0.50	24.4 ±2.00	178 ±1.00

*Note: 1206 case size resistance value R001, 1mΩ packaging quantity is 4,000 (-T4) pcs/reel.

Soldering Profile:



Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (Ts_{max} to Tp)	3 °C/second max.
Preheat	
- Temperature Min (Ts_{min})	150 °C
- Temperature Max (Ts_{max})	200 °C
- Time (ts_{min} to ts_{max})	60-180 seconds
Time maintained above:	
- Temperature (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 (tp)	20-40 seconds
Ramp-Down Rate	6 °C/second max.
Time 25 °C to Peak Temperature	8 minutes max.

Marking Information:

0805: no marking

1206~2512: 4 digits code for all values

Examples of 4 Digit Resistance Codes for 1206~4527								
R-Value	5.6Ω	10Ω	22.6Ω	100Ω	1.1KΩ	10KΩ	332KΩ	1MΩ
Code	5R60	10R0	22R6	1000	1101	1002	3323	1004

Note: “R” designates the decimal location in ohms.
“M” designates the decimal location in milli-ohms.
0Ω, Jumper product marking is 0R.

Storage Conditions:

Environment Conditions:

Products should be stored under the following environmental conditions.

- Temperature: +5 to +35°C
- Humidity: 45 to 85% relative humidity
- 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 oxidization on electrodes, resulting in poor solderability.
- Products should be stored in a space that does not expose it to high temperatures, vibration, or direct sunlight.
- Products should be stored in the original airtight packaging until use.