Thin Film Technology Corp.

Product Family: 2-Terminal Low Ohm Current Sense Resistors

Part Number Series: D1WEL Series

RoHS COMPLIANT 2011/65/EU

HF HALOGEN-FREE

Construction:

- High purity alumina ceramic
- Metal foil resistive element
- Epoxy-resin overcoat
- 100% matte tin over Ni terminations
- Halogen Free
- RoHS compliant and Pb free
- Inherently Anti-Sulfur

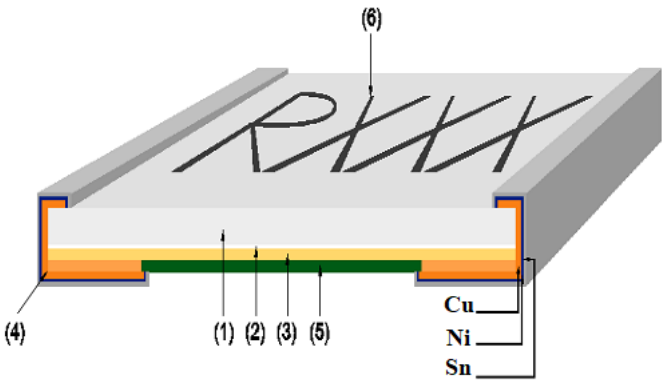
Features:

- 0805 & 2512 English case sizes
- Power up to 2W
- Resistance from 50mΩ~500mΩ
- TCR of ±50 ppm/°C
- Tolerance of ±1.0%
- Moisture Sensitivity Level (MSL) = 1

Description:

These low ohm current sense resistors are designed for tight resistance tolerance, low noise, long-term stability, and high heat dissipation capability in a small package. This series is ideal for use in power management modules, motor control circuits and automotive applications.

Product Construction:

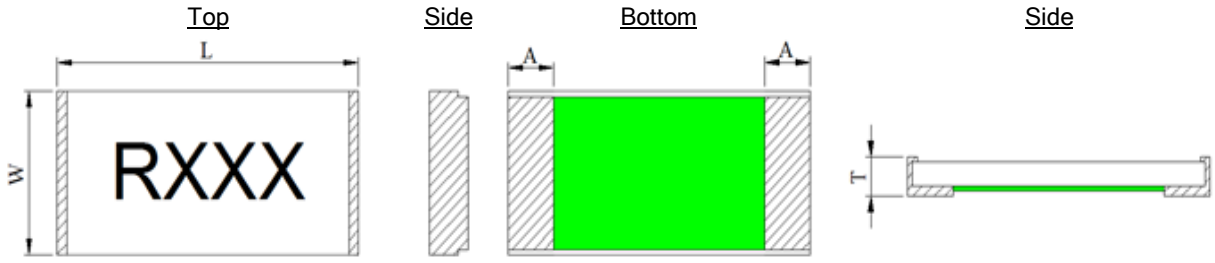


Number	Description
1	Substrate (Alumina ceramic)
2	Adhesion layer (Epoxy)
3	Resistive element (Cu alloy foil)
4	Terminal electrode (Cu, Ni, Sn)
5	Protective coating (Flame-retardant epoxy, UL-94-V0)
6	Marking (Flame-retardant epoxy, UL-94-V0)

Part Numbering: Ex: D1WEL0508CR100F-T5

Series Name	English Size (Metric Size)	Material	Resistance Range	Resistance Tolerance	T&R Packaging Quantity
D1WEL	**0805** (2012) **2512** (6432)	**C**	Ex. **R050** = 50mΩ **R100** =100mΩ (Refer to tables)	**F** = ±1.0%	**-T4** = 4,000 pcs/reel **-T5** = 5,000 pcs/reel (Refer to tables)

Product Dimensions:



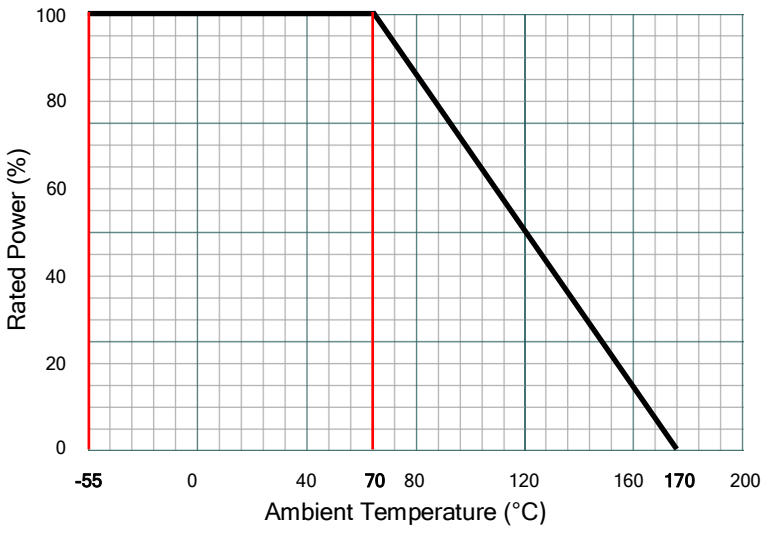
All dimensions shown in inches, mm in parentheses.

Dimension (Metric)	Resistance Range	L	W	A	T
D1WEL0805 (2012)	50mΩ~500mΩ	0.083 ±0.008 (2.10 ±0.20)	0.053 ±0.008 (1.35 ±0.20)	0.020 ±0.008 (0.50 ±0.20)	0.026 ±0.008 (0.65 ±0.20)
D1WEL2512 (6432)	100mΩ~500mΩ	0.252 ±0.012 (6.40 ±0.30)	0.126 ±0.012 (3.20 ±0.30)	0.041 ±0.012 (1.05 ±0.30)	0.026 ±0.008 (0.65 ±0.20)

Electrical Specifications:

Type	D1WEL0805	D1WEL2512
Metric Size	2012	6432
Power Rating	3/4W (0.75W)	2W
Resistance Range	50mΩ,68mΩ, 80mΩ, 200mΩ, 250mΩ, 300mΩ, 301mΩ, 330mΩ, 402mΩ, 499mΩ, 500mΩ	100mΩ, 200mΩ, 500mΩ
Resistance Tolerance (code)	±1.0%(F)	
TCR ±ppm/°C (code)	±50	
Operating Temp. Range	-55°C~+170°C	
Rated Voltage	√(Power x Resistance)	
Packaging (code)	5,000 pcs/reel (-T5)	4,000 pcs/reel (-T4)

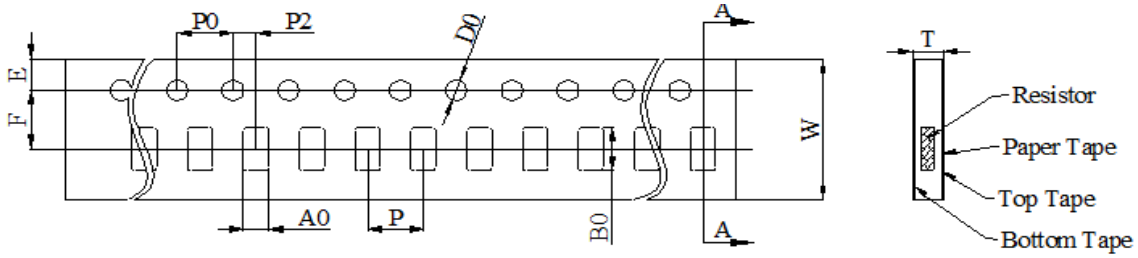
Power Derating Curve:



Reliability Specifications:

Test	Procedure	Specification
Short Time Overload JIEC60115-1 4.13	Applied voltage: 2.5X rated power. Test duration: 5 seconds T = 25 ±2°C	±(1.0%+0.5mΩ)
Load Life IEC60115-1 4.25	Test Temperature: 70°C ±2°C Applied voltage: rated voltage	±(2.0%+0.5mΩ)
Temperature Cycle (Thermal Shock) IEC60115-1 4.19	Repeat 100 cycles as follows: -55°C ±3°C (30 min.) / +155°C ±3°C (30 min.) Transition time of 3 minutes	±(1.0%+0.5mΩ)
Resistance To Solder Heat IEC60115-1 4.18	Through reflow Parts are subjected to 3 reflow cycles	±(1.0%+0.5mΩ)
High Temperature Exposure IEC60115-1 4.25	T = +170°C ±2°C ; t = 1000h	±(1.0%+0.5mΩ)
Low Temp. Storage IEC60115-1 4.25	T = -55°C ±2°C; t = 1000h	±(1.0%+0.5mΩ)
Moisture Load Life IEC60115-1 4.25	$V_{test} = V_{max}$; T = 60°C ±2°C; RH = 95% t = 90 min ON, 30 min OFF, 1000h	±(2.0%+0.5mΩ)
Solderability IEC60115-1 4.17	Dip into solder at T = +245°C ±5°C t = 3 ±1 sec	The covered area >95%
Mechanical Shock IEC60115-1 4.21	A = 100G; t = 6ms	±(1.0%+0.5mΩ)
Substrate Bending IEC60115-1 4.33	Span between fulcrums: 90mm Bend Width: 2mm	±(1.0%+0.5mΩ)

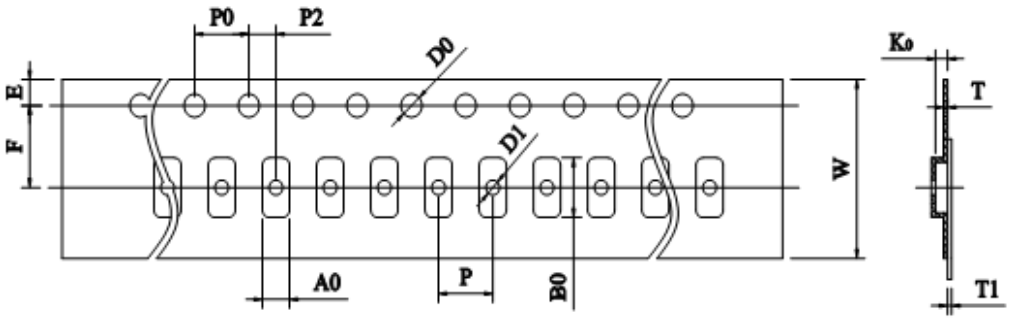
Paper Tape Specifications:



All dimensions in mm.

Type	W	P0	P	P2	A0	B0	D0	F	E	T
D1WEL0805	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	0.87 ±0.10

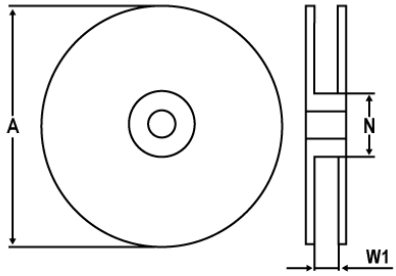
Plastic Tape Dimensions:



All dimensions in mm.

Type	W	P0	P	P2	A0	B0	D0	F	E	T	T1	K0
D1WEL2512	12.0 ±0.30	4.00 ±0.10	4.00 ±0.10	2.00 ±0.10	3.40 ±0.20	6.75 ±0.20	1.50 ±0.10	5.50 ±0.10	1.75 ±0.10	0.25 ±0.10	Max 0.10	1.00 ±0.20

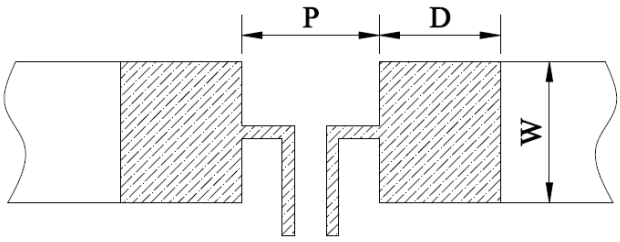
Reel Dimensions:



All dimensions in mm.

Type	A	N	W1
D1WEL0805	178 ±5.00	60.0 ±2.00	9.00 ±1.00
D1WEL2512	178 ±5.00	60.0 ±2.00	13.0 ±1.00

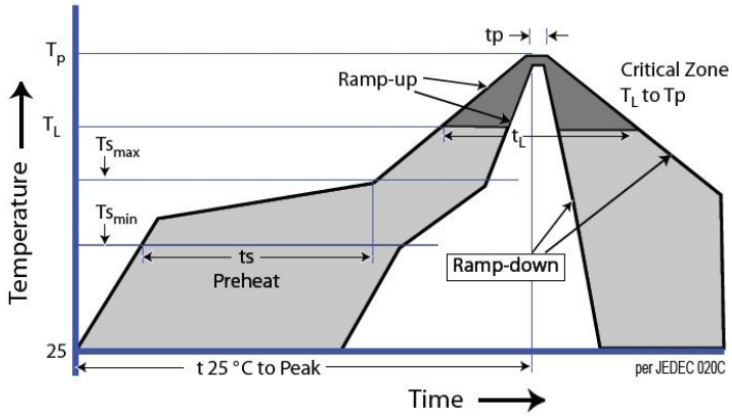
Recommended Land Pattern:



All dimensions in mm.

Type	P	W	D
D1WEL0805	0.80	1.44	1.40
D1WEL2512	3.10	3.57	3.10

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.

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.