

**Features**

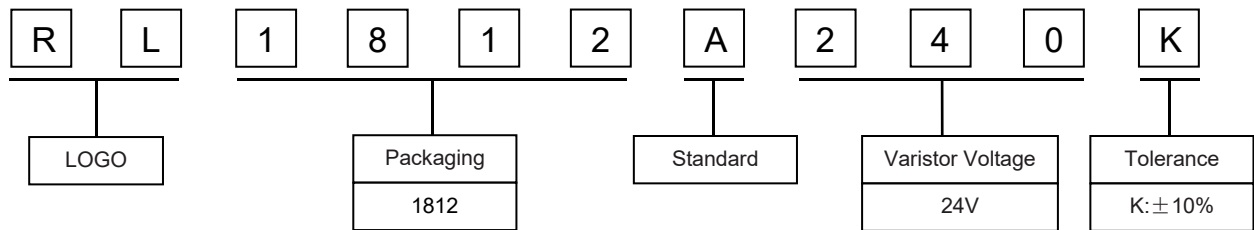
- EIA size:1812
- Variable capacitance
- MSL level 1
- Operating voltage: 3.3Vdc ~505Vdc
- High surge suppress capability
- Bidirectional and symmetrical V/I characteristics
- Multilayer ceramic construction technology
- RoHS & Halogen Free (HF) compliant
- Operating temperature range: -55°C ~ +125°C
- Storage temperature range: 5°C ~ +40°C



**Applications**

- Used to Help Achieve Electromagnetic Compliance of End Products
- Provides On-Board Transient Voltage Protection for ICs, CMOS and MOSFET
- Suppression of Inductive Switching or Other Transient Events Such as EFT and Surge Voltage at the Circuit Board.
- Protection of Components and Circuits Sensitive to ESD Transients Occurring on Power supplies, Control and Signal Lines.

**Part Number Code**



#### Electrical Characteristics

Type Number	Varistor Voltage	Max. Allowable Voltage		Max. Energy (10/1000µs)	Max. Clamping Voltage (8/20µs)		Withstanding Surge Current (8/20µs)
	V <sub>1mA</sub> (V)	V <sub>AC</sub> (V)	V <sub>DC</sub> (V)	(J)	I <sub>P</sub> (A)	V <sub>C</sub> (V)	I(A)
RL1812A5R0K	4.6~8.9	2.3	3.3	0.4	10	20	500
RL1812A8R0K	6.7~10.1	4	5.6	0.4	10	22	500
RL1812A180K	16.8~21	10	14	0.4	10	42	800
RL1812A220K	19.2~24	11	16	1.5	10	48	800
RL1812A240K	21.6~27	13	18	1.5	10	54	800
RL1812A270K	24~30	14	20	1.5	10	60	800
RL1812A300K	26.4~33	16	22	1.5	10	63	800
RL1812A330K	28.8~36	17	24	1.5	10	68	800
RL1812A360K	31.2~39	18	26	1.5	10	74	800
RL1812A390K	33.6~42	20	28	1.5	10	80	800
RL1812A420K	36~45	21	30	1.5	10	86	800
RL1812A470K	42~52.5	25	35	1.5	10	95	800
RL1812A560K	50.4~63	30	42	1.5	10	107	800
RL1812A680K	60~75	35	50	1.8	10	128	800
RL1812A820K	72~90	42	60	1.8	10	149	800
RL1812A101K	90~110	53	75	1.8	10	176	800
RL1812A121K	108~132	64	90	1.8	10	211	500
RL1812A141K	121.5~148.5	71	100	1.8	10	238	500
RL1812A151K	135~165	95	125	2.3	10	260	400
RL1812A181K	162~198	115	150	2.3	10	300	400
RL1812A201K	180~220	120	160	2.3	10	340	400
RL1812A221K	198~242	130	170	2.3	10	360	400
RL1812A241K	216~264	150	200	2.3	10	415	400
RL1812A271K	243~297	175	225	2.3	10	475	400
RL1812A331K	297~363	210	275	2.3	10	550	400
RL1812A361K	324~396	230	300	2.3	10	595	400
RL1812A391K	351~429	250	320	2.3	10	675	400
RL1812A431K	387~473	275	350	2.3	10	710	400
RL1812A471K	423~517	300	385	2.3	10	775	400
RL1812A511K	459~561	320	410	2.3	10	850	250
RL1812A561K	504~616	350	455	2.3	10	925	250
RL1812A621K	558~682	385	505	2.3	10	1025	200

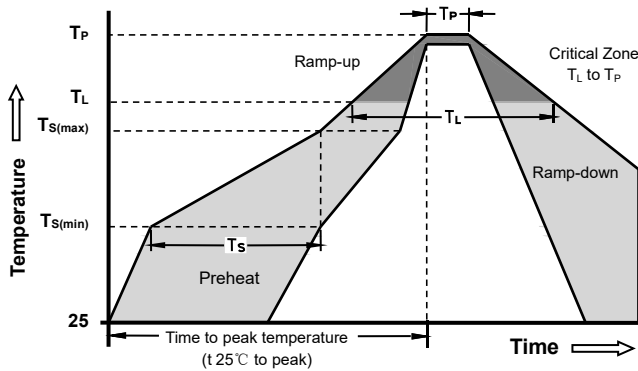
**Environmental Performance**

Item	Specifications	Test Condition
Bias Humidity	$V_V / V_V \leq \pm 10\%$	90%RH, 40°C, Working Voltage, 1000 hrs
Thermal Shock	$V_V / V_V \leq \pm 10\%$	-40°C to 85°C, 30min.cycle, 5 cycles
Full Load Voltage	$V_V / V_V \leq \pm 10\%$	Working Voltage, 85°C, 1000 hrs

**General Technical Data**

Response Time	<1ns	
Solderability	245±5 °C, 3±1sec	
Solder leach resistance	260±5 °C, 10±1sec	
Taping Package Storage Condition	Storage Temperature	5~40°C
	Relative Humidity	To 65%
	Storage Time	12 Months max

**Soldering Parameters - Reflow Soldering (Surface Mount Devices)**



Reflow Condition		Pb - Free assembly
Pre Heat	- Temperature Min ( $T_{s(min)}$ )	150°C
	- Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (min to max) ( $t_s$ )	60 - 180 Seconds
Average ramp up rate ( Liquids Temp $T_L$ to peak)		3°C/second max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/second max
Reflow	- Temperature ( $T_L$ ) (Liquids)	217°C
	- Time (min to max) ( $t_s$ )	60 - 150 Seconds
Peak Temperature ( $T_P$ )		260 +0/-5°C
Time within 5°C of actual peak Temperature ( $t_p$ )		20 - 40 Seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature ( $T_P$ )		8 minutes Max
Do not exceed		260°C

**Precaution for soldering**

Note that this product will be easily damaged by rapid heating, rapid cooling or local heating.

Do not give heat shock over 100°C in the process of soldering. We recommend to take preheating and gradual cooling

**Soldering gun procedure**

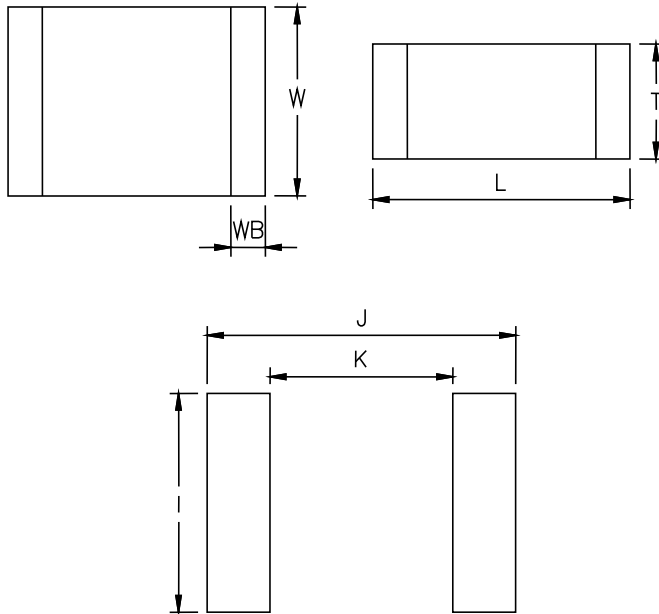
Note the follows, in case of using solder gun for replacement.

- 1)The tip temperature must be less than 280 for the period within 3 seconds by using soldering gun under 30W
- 2) The soldering gun tip shall not touch this product directly.

**Soldering volume**

Note that excess of soldering volume will easily get crack the body of this product.

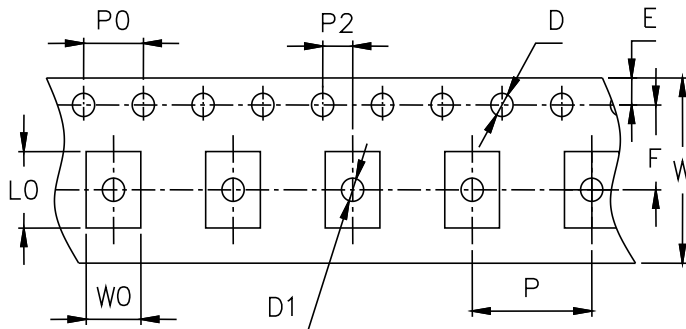
Dimensions And Recommended Pad Layout



Recommended Soldering Pad Layout

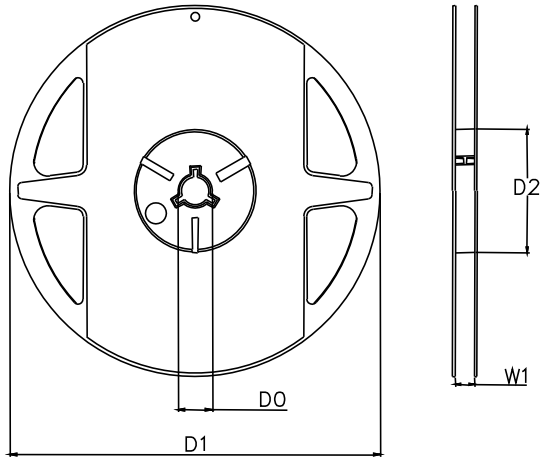
Symbol	Millimeters	Inches
L	4.50±0.40	0.177±0.016
W	3.20±0.20	0.126±0.008
T <sub>max.</sub>	3.20	0.126
WB	0.60±0.25	0.024±0.01
I	3.7	0.146
J	5.4	0.213
K	3.2	0.126

Taping and Reel Specifications



Symbol	Millimeters	Inches
W	12.00±0.20	0.472±0.008
E	1.75±0.10	0.069±0.004
F	5.50±0.05	0.217±0.002
D	1.55±0.05	0.061±0.002
D1	Φ1.50±0.05	Φ0.059±0.002
P	8.00±0.10	0.315±0.004
P0	4.00±0.05	0.157±0.002
P2	2.00±0.05	0.079±0.002
L0	5.45±0.10	0.215±0.004
W0	4.20±0.10	0.165±0.004

**Packing Specifications**



Symbol	Millimeters	Inches
<b>D0</b>	13.5±0.1	0.531±0.004
<b>D1</b>	178±2.0	7.008±0.079
<b>D2</b>	Φ60.0±0.5	Φ2.362±0.02
<b>W1</b>	13.08±0.2	0.515±0.008

**Taping Specifications**

There Shall be the portion having no product in both the head and the end of taping, and there shall be the cover tape in the heat of taping.

**Quantity of products in the taping package**

Model	SIZE EIA (EIAJ)	1812
5R0K~271k	Standard Packing Quantity (PCS/reel)	1000
331K~621k	Standard Packing Quantity (PCS/reel)	500