

## Features

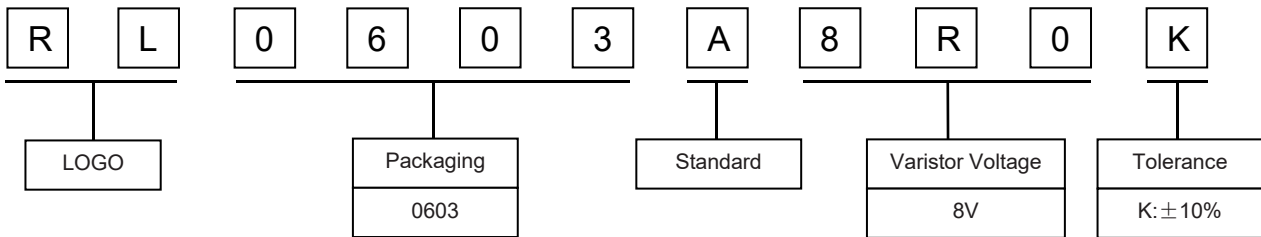
- EIA size:0603
- Variable capacitance
- MSL level 1
- Operating voltage: 3.3Vdc ~60Vdc
- High surge suppress capability
- Bidirectional and symmetrical V/I characteristics
- Multilayer ceramic construction technology
- RoHS & Halogen Free (HF) compliant
- Operating temperature range: -55°C ~ +125°C
- 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 (10/1000 $\mu$ s)	Max. Clamping Voltage (8/20 $\mu$ s)		Withstanding Surge Current (8/20 $\mu$ s)
	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)
RL0603A8R0K	6.7~10.1	4	5.6	0.1	1	22	20
RL0603A120K	9.6-14.4	5	8	0.1	1	30	20
RL0603A180K	16.8~21	10	14	0.1	1	42	30
RL0603A220K	19.2~24	11	16	0.1	1	48	30
RL0603A240K	21.6~27	13	18	0.1	1	54	30
RL0603A270K	24~30	14	20	0.1	1	60	30
RL0603A300K	26.4~33	16	22	0.1	1	63	30
RL0603A330K	28.8~36	17	24	0.1	1	68	30
RL0603A360K	32.4~40.5	19	27	0.1	1	77	30
RL0603A390K	33.6~42	20	28	0.1	1	80	30
RL0603A420K	36~45	21	30	0.1	1	86	30
RL0603A470K	42-52.5	25	35	0.1	1	95	30
RL0603A560K	50.4-63	30	42	0.1	1	107	30
RL0603A680K	60-75	35	50	0.1	1	128	30
RL0603A820K	72-90	42	60	0.1	1	149	30

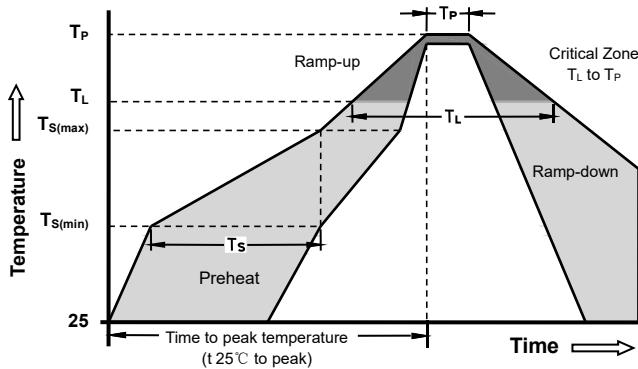
**Environmental Performance**

Item	Specifications	Test Condition
Bias Humidity	V <sub>V</sub> / V <sub>V</sub> ±10%	90%RH, 40°C, Working Voltage, 1000 hrs
Thermal Shock	V <sub>V</sub> / V <sub>V</sub> ±10%	-40°C to 85°C, 30min.cycle, 5 cycles
Full Load Voltage	V <sub>V</sub> / V <sub>V</sub> ±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)**



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

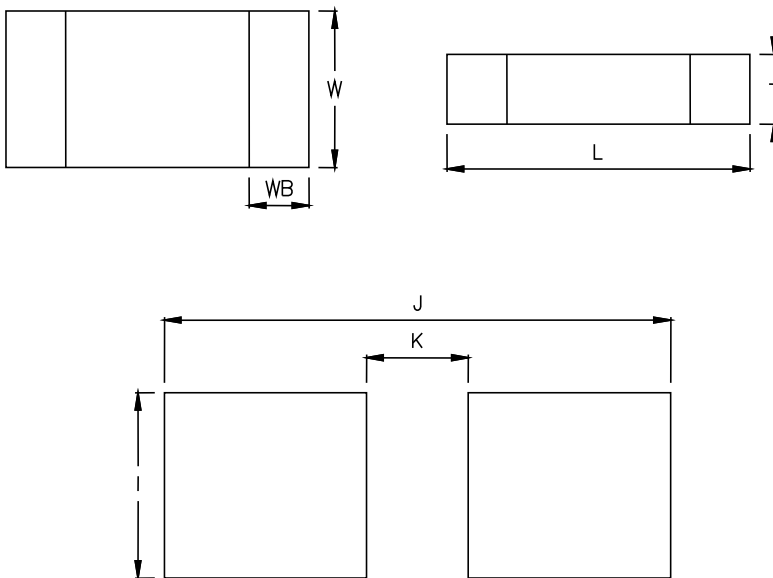
**Soldering gun procedure**

- 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.

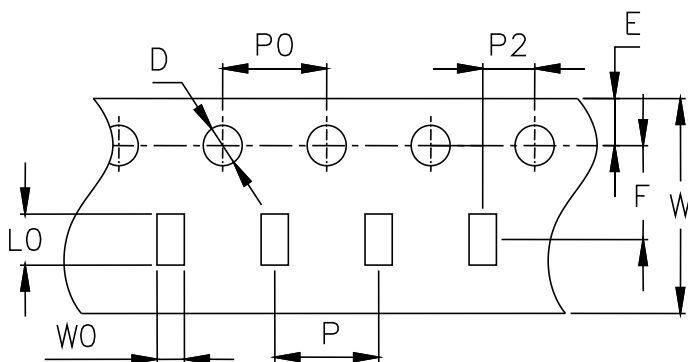
**Dimensions**



**Recommended Soldering Pad Layout**

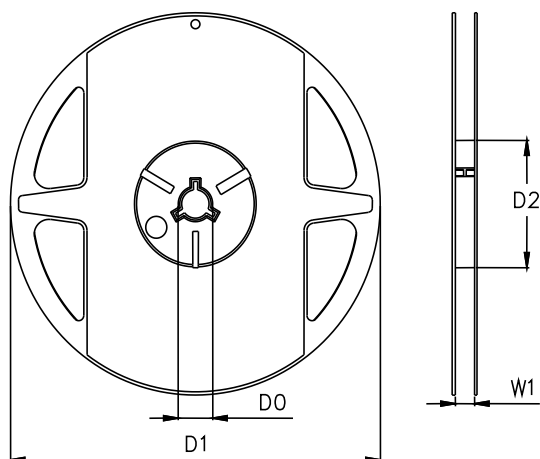
Symbol	Millimeters	Inches
<b>L</b>	1.52±0.25	0.06±0.01
<b>W</b>	0.76±0.25	0.03±0.01
<b>T<sub>max.</sub></b>	1.01	0.04
<b>WB</b>	0.30±0.15	0.012±0.006
<b>I</b>	0.9	0.035
<b>J</b>	2.54	1
<b>K</b>	0.51	0.02

Taping and Reel Specifications



Symbol	Millimeters	Inches
W	8.00±0.20	0.315±0.008
E	1.75±0.10	0.069±0.004
F	3.50±0.05	0.138±0.002
D	1.55±0.05	0.061±0.002
P	4.00±0.10	0.157±0.004
P0	4.00±0.10	0.157±0.004
P2	2.00±0.05	0.079±0.002
L0	1.88±0.10	0.074±0.004
W0	1.08±0.10	0.043±0.004

Packing Specifications



Symbol	Millimeters	Inches
D0	13.0±0.2	0.512±0.008
D1	178±2.0	7.008±0.079
D2	Φ60.0±0.5	Φ2.362±0.02
W1	9.3±0.5	0.366±0.02

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

SIZE EIA (EIAJ)	0603
Standard Packing Quantity(PCS/reel)	4000