

### Features

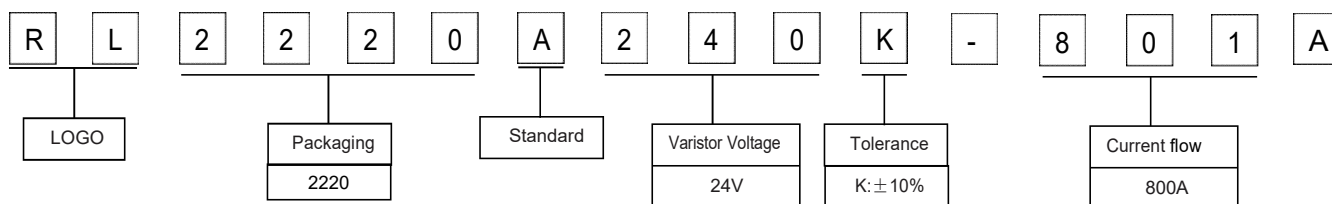
- EIA size:2220
- Variable capacitance
- Operating voltage: 18Vdc ~560Vdc
- High surge suppress capability
- Bidirectional and symmetrical V/I characteristics
- Multilayer ceramic construction technology
- RoHS & Halogen Free (HF) compliant
- Operating temperature range: -55°C ~ +125°C
- Storage temperature 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)
RL2220A240K	21.6~27	14	18	2.5	10	59	1200
RL2220A240K-302A	22~28	12.7	18	4	10	45	3000
RL2220A270K	26.4~33	17	22	2.5	10	72	1200
RL2220A300K	28.8~36	18	24	2.5	10	79	1200
RL2220A330K	31.2~39	20	26	2.5	10	85	1200
RL2220A390K	36~45	25	30	2.5	10	99	1200
RL2220A420K-302A	37~46	21.3	30	7	10	70	3000
RL2220A470K	45.6~57	30	38	2.5	10	125	1200
RL2220A500K-302A	46~54	30	38	8	10	80	3000
RL2220A500K-502A	46~54	30	38	10	10	80	5000
RL2220A500K-802A	46~54	30	38	12	10	80	8000
RL2220A530K	50.4~63	32	42	2.5	10	138	1200
RL2220A560K	54~67.5	35	45	2.5	10	148	1200
RL2220A600K-302A	54~67	34.1	48	10	10	110	3000
RL2220A680K	67.2~84	40	56	2.5	10	184	1200
RL2220A680K-502A	61~75	40	56	17	10	125	5000
RL2220A750K-302A	69 ~83	46	60	5	10	130	3000
RL2220A750K-502A	69 ~83	46	60	5	10	130	5000
RL2220A760K	72~90	43	60	2.5	10	198	1200
RL2220A820K	78~97.5	46	65	2.5	10	214	1200
RL2220A820K-302A	73~91	50	65	10	10	135	3000
RL2220A820K-502A	73~91	50	65	10	10	135	5000
RL2220A900K	81.6~102	49	68	2.5	10	224	1200
RL2220A101K	102~127.5	60	85	2.5	10	280	1200
RL2220A101K-452A	90~110	60	85	4	10	165	4500
RL2220A121K-801A	108~132	75	100	4	10	200	800
RL2220A121K-402A	108~132	75	100	21	10	200	4000
RL2220A151K-202A	135~165	95	125	12	5	260	2000
RL2220A181K	162~198	115	150	5.6	10	315	500
RL2220A181K-152A	162~198	115	150	12	5	325	1500
RL2220A221K	198~242	140	180	5.6	10	360	500
RL2220A241K	216~264	150	200	5.6	10	415	500
RL2220A271K	243~297	175	225	5.6	10	475	500
RL2220A391K	351~429	250	320	8.5	10	650	500
RL2220A431K	387~473	275	350	8.5	10	710	500
RL2220A471K	423~517	300	385	8.5	10	775	500
RL2220A561K	504~616	350	455	10.0	10	925	500

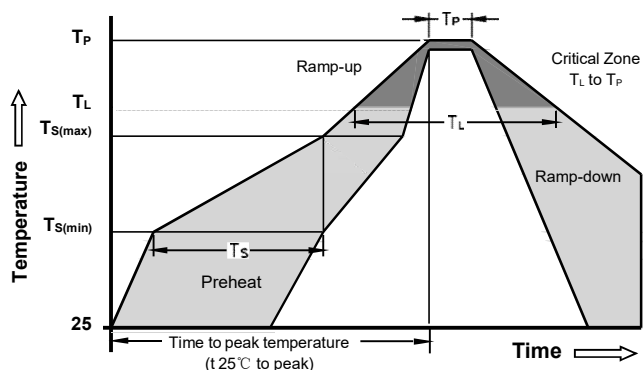
**Environmental Performance**

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)**



<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

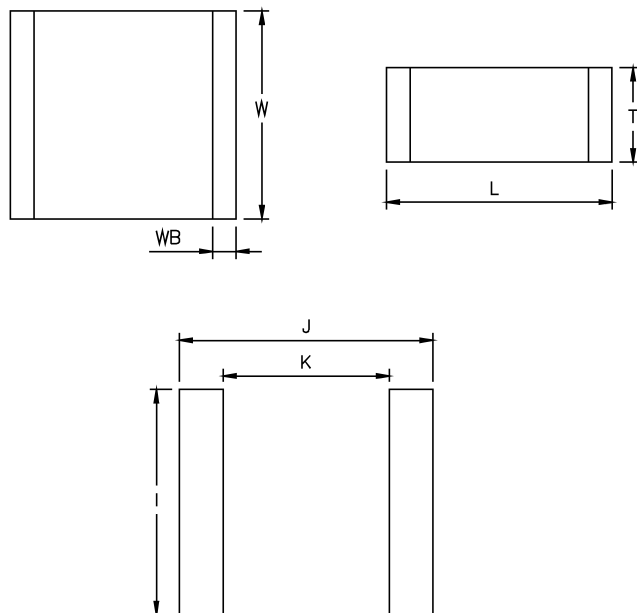
**Soldering gun procedure**

- 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.

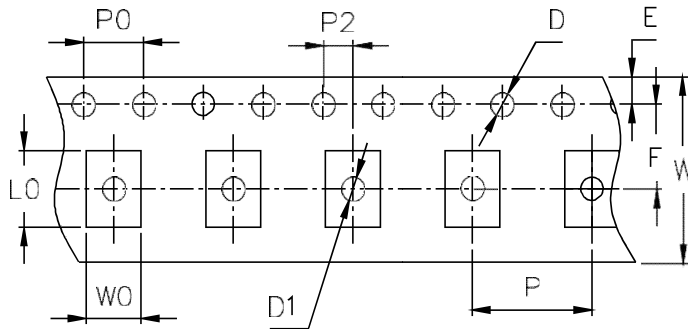
**Dimensions And Recommended Pad Layout**



**Recommended Soldering Pad Layout**

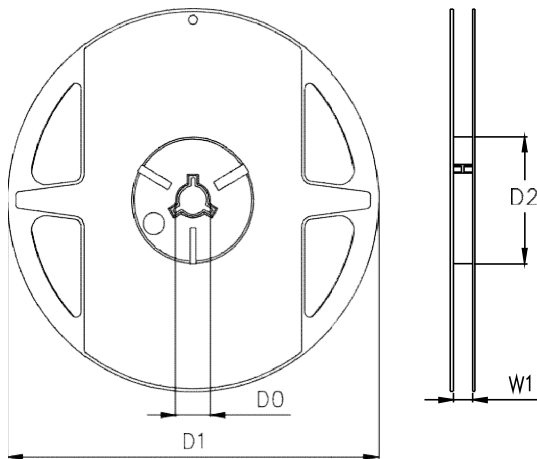
Symbol	Millimeters	Inches
L	5.70±0.50	0.224±0.02
W	5.08±0.50	0.20±0.02
$T_{max}$	3.80	0.15
WB	0.60±0.25	0.024±0.01
I	5.5	0.217
J	6.4	0.252
K	4.2	0.165

## Taping and Reel Specifications



Symbol	Millimeters	Inches
<b>W</b>	12.00±0.20	0.472±0.008
<b>E</b>	1.75±0.10	0.069±0.004
<b>F</b>	5.50±0.05	0.217±0.002
<b>D</b>	1.55±0.05	0.061±0.002
<b>D1</b>	Φ1.50±0.05	Φ0.059±0.002
<b>P</b>	8.00±0.10	0.315±0.004
<b>P0</b>	4.00±0.05	0.157±0.002
<b>P2</b>	2.00±0.05	0.079±0.002
<b>L0</b>	7.62±0.10	0.300±0.004
<b>W0</b>	6.57±0.10	0.259±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>	12.82±0.2	0.505±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)	2220
240K~271K	Standard Packing Quantity (PCS/reel)	1000
391K~561K	Standard Packing Quantity (PCS/reel)	500