

**RUILON**

瑞隆源电子



# ESD Protection Device

**RL0402E Series**

**361°** Circuit Protection  
System

Revision: APR-17

Please refer to <http://www.ruilon.com.cn> for current information.

## ESD Protection Device - RL0402E Series

### Features

- Excellent ESD clamping & Small Insertion Loss
- High transient current capability, Fastest response time
- Capacitance is designed to ultra-low value, which can be efficiently suitable to high speed data line.
- EU-RoHS Compliance



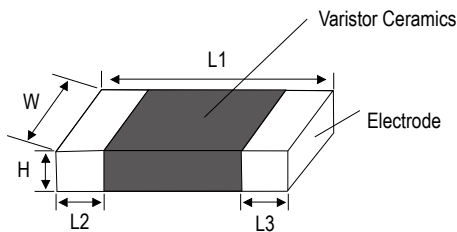
### Applications

- Transient voltage protection for IC and transistor
- ESD and I/O protection
- EFT and burst protection
- Portable equipment protection, such as mobile phone, PDA

### Product Name

R	L	0	4	0	2	E	0	0	5	M	0	1	5	K
Brand Name		EIA 0402		Type E:ESD		Max. Operating Voltage V <sub>DC</sub>			Null		Capacitance 0.15PF		Capacitance error ±20%	

### Package Dimensions (Unit:mm)



EIA	L1	W	H	L2&L3
0402	1.00±0.15	0.50±0.10	0.60(Max)	0.25±0.15

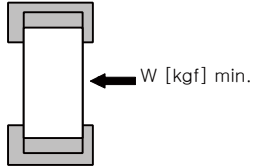
## ESD Protection Device - RL0402E Series

### Electrical Characteristics Per Lin (@ 25°C Unless Otherwise Specified)

Type Number	Max. Operating Voltage V <sub>DC</sub>	Max. Leakage Current	Capacitance @1MHz	Trigger Voltage	Clamping Voltage
	V	uA	pF	V	V
RL0402E005M005K	5	0.001	0.05	450	50
RL0402E005M015K	5	0.05	0.15	250	50
RL0402E005M100K	5	1	1	100	50
RL0402E005M200K	5	1	2	50	25
RL0402E005M250K	5	1	2.5	50	25
RL0402E005M300K	5	1	3	50	25
RL0402E005M500K	5	1	5	50	25
RL0402E008M015K	8	1	0.15	250	50
RL0402E008M100K	8	1	1	200	50
RL0402E008M200K	8	1	2	50	25
RL0402E008M250K	8	1	2.5	50	25
RL0402E008M300K	8	1	3	50	25
RL0402E008M500K	8	1	5	50	25
RL0402E012M015K	12	1	0.15	200	50
RL0402E012M100K	12	1	1	200	50
RL0402E012M200K	12	1	2	50	25
RL0402E012M250K	12	1	2.5	50	25
RL0402E012M300K	12	1	3	50	25
RL0402E012M500K	12	1	5	50	25
RL0402E018M015K	18	1	0.15	250	50
RL0402E018M100K	18	1	1	200	50
RL0402E018M200K	18	1	2	125	50
RL0402E018M250K	18	1	2.5	125	50
RL0402E018M300K	18	10	3	500	50
RL0402E018M500K	18	10	5	500	50
RL0402E024M015K	24	10	0.15	500	50
RL0402E024M100K	24	10	1	500	50
RL0402E024M200K	24	10	2	500	50
RL0402E024M250K	24	10	2.5	500	50
RL0402E024M300K	24	10	3	500	50
RL0402E024M500K	24	10	5	500	50

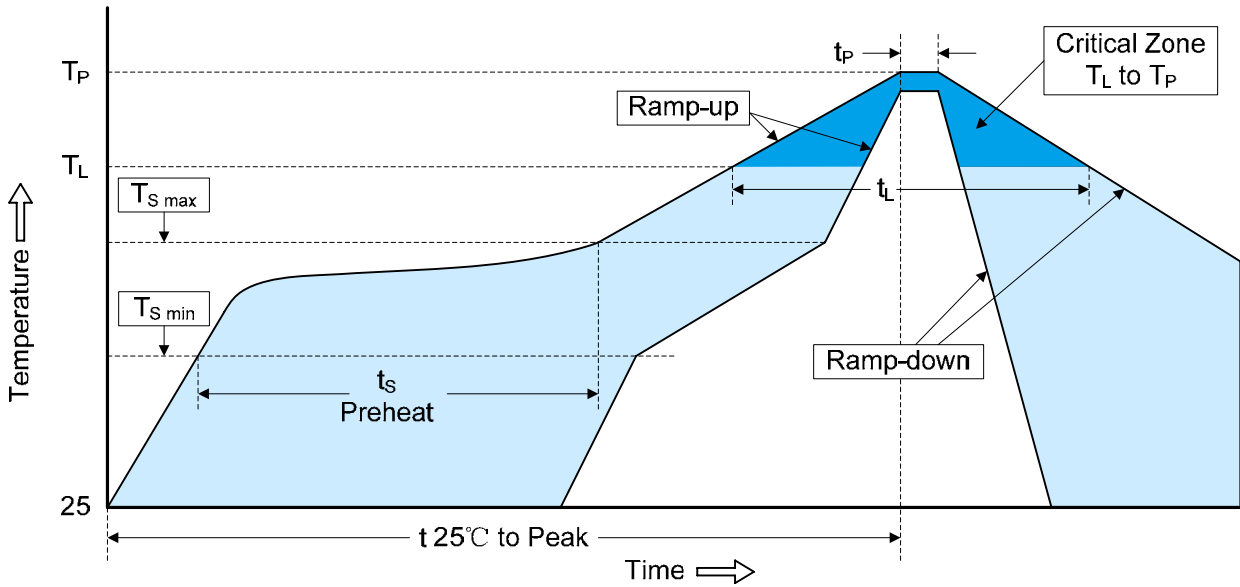
## ESD Protection Device - RL0402E Series

### Electrical Rating

No	Item	Test Condition / Description	Requirement
1	Operation Range	1. -550°C ~ 85°C	-
2	Leakage current	Satisfaction to the specification, under 1uA	Applied voltage : specified working voltage
3	Capacitance	Satisfaction to the specification, under 1pF	Frquency & OSC level : 1MHz, 1.0Vrms
4	Solderability	More than 90% of the terminal electrode shall be covered with new solder.	1. Type of solder : H63A 2. Soldering Temp & Time : 230+/-5°C, 5+/-1 sec
5	Reflow soldering	1. No Serious mechanical damage 2. More than 50% of the terminal electrode shall be covered with new solder 3. Leakage Current : ≤ 10uA	1. Type of solder : H63A 2. Temp & Time : max 260+/-5°C, min 10sec
6	Humidity Load Test	1. No Serious mechanical damage 2. Leakage Current : ≤ 10uA	Test Temp. & Relative Humidity & Time : 85+/- 5°C, 85 +/- 5% RH
7	Thermal Shock	1. No Serious mechanical damage 2. Leakage Current : ≤ 10uA	1. Step 1 : -40 +/- 5°C, Step 2 : 85 +/- 5°C 2. Cycle : 30min ± 3min, each 5 cycles
8	High Temp. Test	1. No Serious mechanical damage 2. Leakage Current : ≤ 10uA	Temp. & time : 85+/-5°C , 1000 +/- 24hrs
9	Adhesive strength	1. No Serious mechanical damage under condition of 1005 : min 0.5kgf, 1608 : min 1.0kgf	
10	ESD	1. No mechanical damage after test 2. Leakage Current : ≤ 10uA * ESD gun (IEC61000-4-2 standard) * C=150pF R=330Ω	1. Contact discharge * Voltage : +/-8kV(Level 4) * Number : 10 times in 10sec 2. Air discharge * Voltage : +/-15kV(Level 4) * Number : 10 times in 10sec

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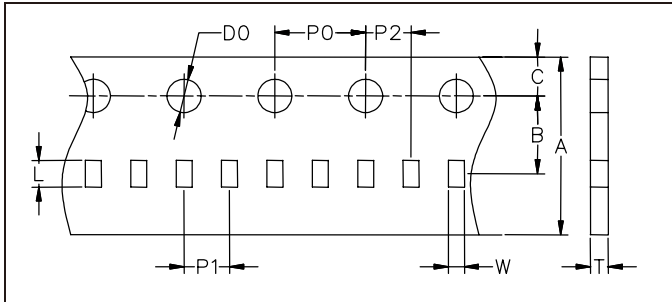
### Recommended Soldering Conditions



Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat	
-Temperature Min ( $T_{S\ min}$ )	150°C
-Temperature Max ( $T_{S\ max}$ )	200°C
-Time (min to max) ( $t_s$ )	60-180 seconds
$T_{S\ max}$ to $T_L$	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
-Temperature ( $T_L$ )	217°C
-Time ( $t_L$ )	60-150 seconds
Peak Temperature ( $T_P$ )	260°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	8 minutes max.

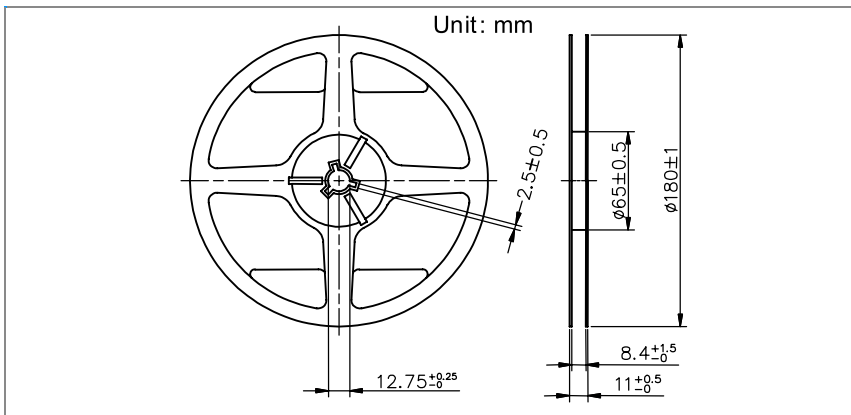
## ESD Protection Device - RL0402E Series

### Packing Specifications



Size EIA (EIAJ)	0402	
Symbol	Inches	Millimeters
A	0.315±0.012	8.00±0.30
B	0.138±0.002	3.50±0.05
C	0.069±0.002	1.75±0.05
D0	0.061±0.002	1.55±0.05
P0	0.157±0.004	4.00±0.10
P1	0.079±0.002	2.00±0.05
P2	0.079±0.002	2.00±0.05
W	0.023±0.001	0.59±0.03
L	0.044±0.001	1.12±0.03
T	0.024±0.001	0.60±0.03

#### Taping Reel Dimensions



#### 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)	0402 (1005)
Standard Packing Quantity (PCS / reel)	10,000

The contents of a box :

0402 Series: 6 reels / inner box