

# Surface Mount Polymer ESD Suppressors

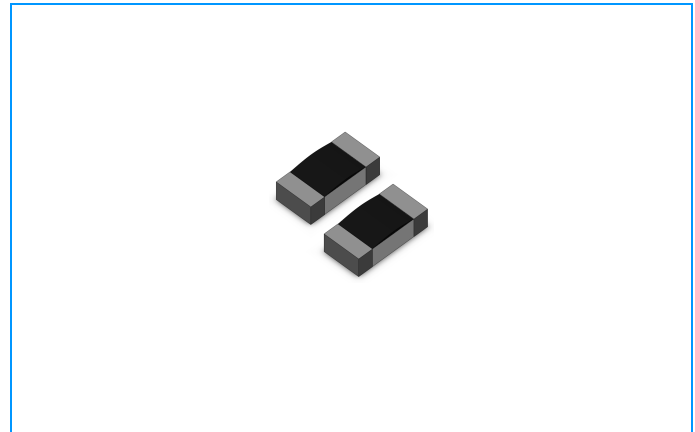
## ESD0402LC05N15

### Description

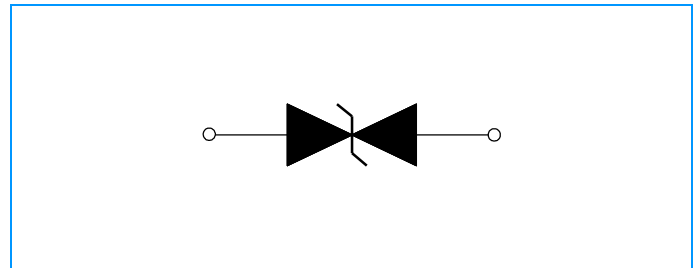
ESD0402LC05N15 is applied to electrostatic discharge (ESD) protection. It is designed to protect the high-speed data lines against ESD transients. It has very low capacitance and fast turn on times makes it ideal for data and transmission lines with high data rates. It can apply to HDMI, USB3.0, Display port, Thunderbolt, etc.

### Features

- u Protection against ESD voltages and currents (IEC61000-4-2 Level 4)
- u Extremely quick response time (<1ns) present ideal ESD protection
- u Extremely low capacitance (0.05pF typical)
- u Bi-directional device
- u SMD (Surface Mount Device)
- u Zero signal distortion



### Equivalent Circuits



### Electrical Characteristics

	Symbol	Unit	Min	Typical	Max.
Rated Voltage	$V_{DC}$	V			15
Trigger Voltage	$V_T$	V		300	
Clamping Voltage	$V_C$	V		20	
Capacitance, @1MHz	$C_P$	pF		0.05	
Response time		ns			1
ESD Voltage Capability, Contact Discharge Mode		KV		8	
ESD Voltage Capability, Air Discharge Mode		KV		15	
ESD Pulse Withstand		Pulses		1000	

$V_T$  - Measurement by using Transmission Line Pulse (TLP)

$V_C$  - Measurement by using Transmission Line Pulse (TLP)

$C_P$  - Device Capacitance measured with 1Vrms

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## ESD0402LC05N15

### Explanation of Part Number

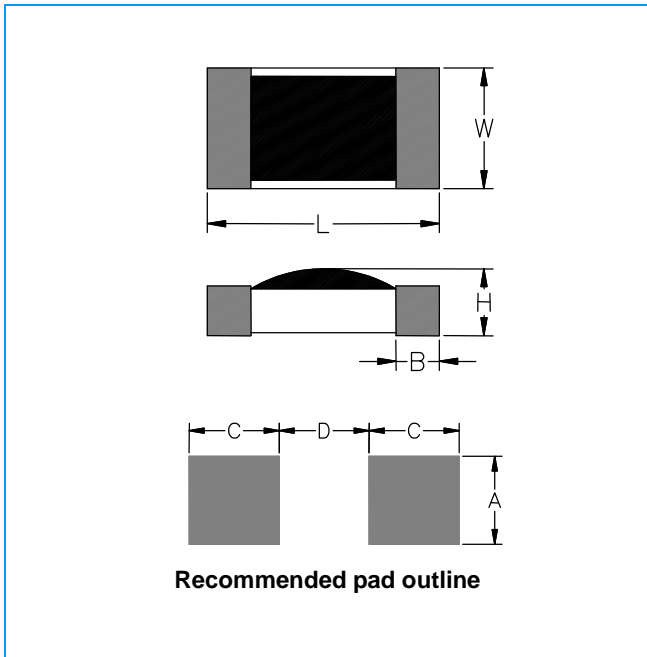
<b>ESD</b>	<b>0402</b>	<b>LC</b>	<b>05</b>	<b>N</b>	<b>15</b>
(1)	(2)	(3)	(4)	(5)	(6)

- (1) Series Type: ESD Guard™ Series
- (2) Chip Size (EIA): 0402
- (3) Series Type: Extremely low capacitance CEMI / ESD Protection
- (4) Capacitance: Value - xx, 05=0.05pF
- (5) Capacitance Tolerance: N -  $\pm 30\%$ , M -  $\pm 20\%$
- (6) Rated Voltage, VDC

### Construction & Dimensions Unit: mm

<b>Substrate</b>	Ceramic (Alumina)
<b>Encapsulate</b>	Polymer
<b>End termination</b>	Ag / Ni / Sn

Symbol	Spec.
<b>L</b>	1.00 $\pm$ 0.1
<b>W</b>	0.50 $\pm$ 0.1
<b>H</b>	0.38 $\pm$ 0.1
<b>B</b>	0.25 $\pm$ 0.15
<b>A</b>	0.50 $\pm$ 0.1
<b>C</b>	0.50 $\pm$ 0.1
<b>D</b>	0.50 $\pm$ 0.1



# Surface Mount Polymer ESD Suppressors

## ESD0402LC05N15

### Environmental Specifications

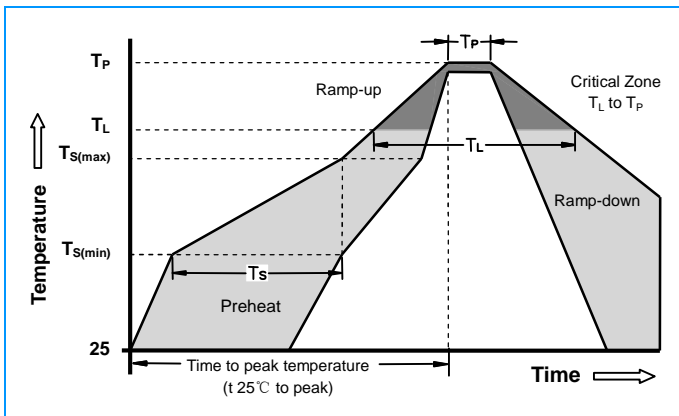
Item	Specifications	Test Condition	Reference
<b>Thermal Shock</b>	$I_L \leq 10\mu A$	-40°C to +85°C, 30 min. cycle, 5 cycles	JIS C0025 (1998)Test Na
<b>High Temperature</b>	$I_L \leq 10\mu A$	Rated Voltage, 85°C, 1000hrs	MIL-STD-202G Method 108
<b>Solder leach Resistance</b>	$I_L \leq 10\mu A$	260°C, 10s	MIL-STD-202G Method 210F

$I_L$  - Leakage current at rated voltage, the maximum leakage current was measured after reliability test.

### Temperature Specifications

Parameter	Value	Unit
<b>Operating Temperature</b>	-55 to +85	°C
<b>Storage Temperature</b>	--55 to +85	°C
<b>Taping Package Storage Condition</b>	<b>Storage Temperature</b>	5 to 40 °C
	<b>Relative Humidity</b>	<65 %RH
	<b>Storage Time</b>	12 Max Month

### Construction & Dimensions Unit: mm



### 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.

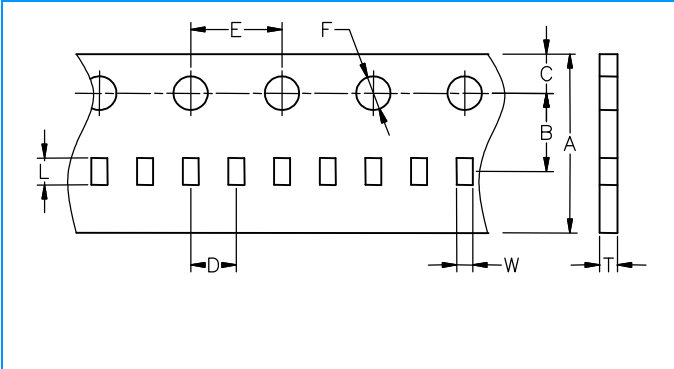
<b>Reflow Condition</b>		Pb free assembly
<b>Pre Heat</b>	-Temperature Min ( $T_{s(min)}$ )	+150°C
	-Temperature Max ( $T_{s(max)}$ )	+200°C
	-Time (min to max) ( $T_s$ )	60 -180 Seconds
<b>Average ramp up rate ( Liquidus Temp <math>T_L</math>) to peak</b>		3°C/Second Max
<b><math>T_{s(max)}</math> to <math>T_L</math> - Ramp-up Rate</b>		3°C/Second Max
<b>Reflow</b>	- Temperature ( $T_L$ ) (Liquidus)	+217°C
	- Time (min to max) ( $T_L$ )	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

# Surface Mount Polymer ESD Suppressors

## ESD0402LC05N15

### Packaging Information

#### Carrier Tape Dimensions Unit: mm

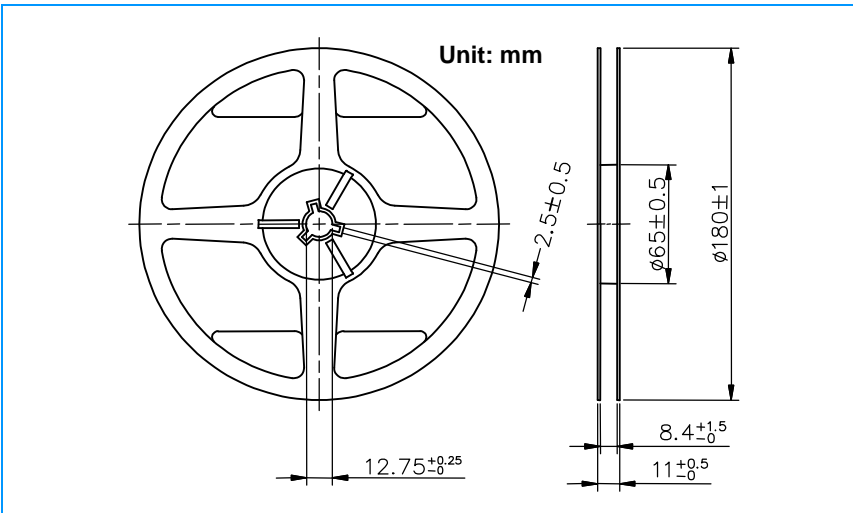


Symbol	0402
A	8.00±0.30
B	3.50±0.05
C	1.75±0.10
D	2.00±0.05
E	4.00±0.10
F	1.50±0.10
L	1.19±0.05
W	0.69±0.05
T	0.48±0.03

#### Packaging method

- Products shall be heat-sealed in the chip pocket, spacing pitch 2-mm of paper carrier tape with cover tape, and carrier tape shall be reeled to the reel.
- Tape material to be paper.
- Cover Tape adhesion to be 40±15 grams.

#### 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

Standard Quantity	0402	10,000PCS / Reel
Shipping quantity is a multiple of standard quantity		