

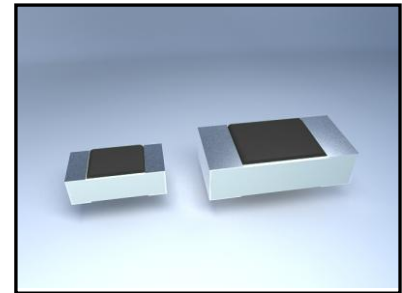
ESD Suppressor : LCP Series

Ultra-Low Capacitance ESD Suppressor for High-Speed Application



■ Features

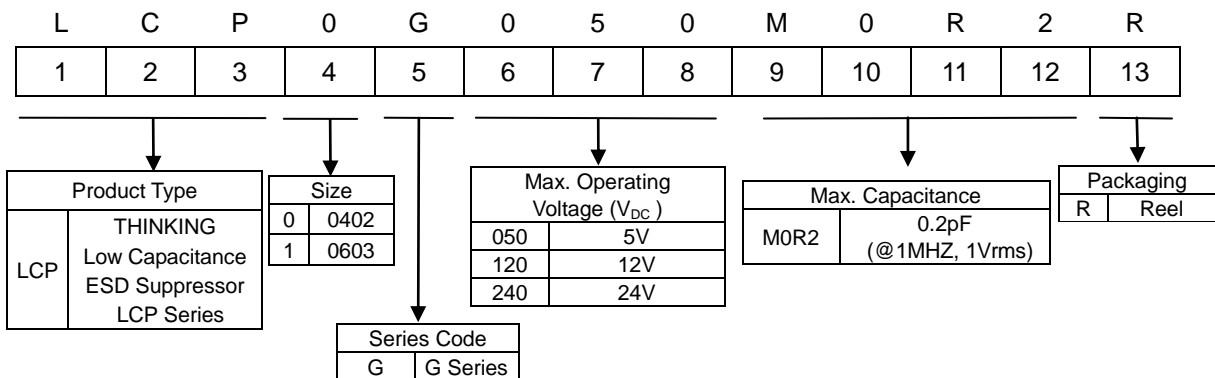
1. RoHS compliant and lead-free
2. EIA size 0402, 0603
3. Ultra-low capacitance (<0.2pF) and low leakage current (<0.05uA)
4. Fast response time (<1ns)
5. Bi-directional device
6. Rate for ESD protection and pass IEC 61000-4-2 level 4 test



■ Recommended Applications

1. High-Speed Data Lines (HDMI, Serial ATA, USB, IEEE1394)
2. Antenna Circuit (Cellular phone, GPS...)
3. Digital Cameras
4. Set-Top Boxes
5. Printer Ports

■ Part Number Code

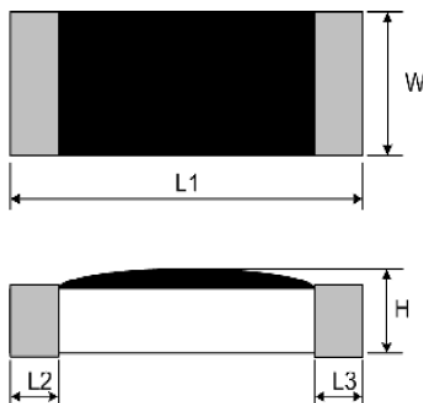


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Structures and Dimensions



(Unit: mm)

Part No.	Size (EIA)	L1	W	H	L2 and L3
LCP0G	0402	1.00 ± 0.15	0.50 ± 0.10	0.35 ± 0.10	0.20 ± 0.10
LCP1G	0603	1.60 ± 0.15	0.80 ± 0.15	0.50 ± 0.15	0.35 ± 0.15

Electrical Characteristics

Part No.	Size	Max. Operating Voltage	Typical Trigger Voltage	Max. Capacitance @1MHz, 1Vrms	Clamping Voltage @8KV, 30ns (*1)		Max. Leakage Current @V _{DC}	Min. ESD Pulse Withstand	Insulation Resistance	Operating Temperature Range	
		V _{DC} (V)	V _T (V)	C (pF)	V _c (V)		I _L (μA)	Times	R(MΩ)	(°C)	
					Typical	Max.					
LCP0G050M0R2	0402	5	300	0.2	30	100	0.05	1000	>100	-40 ~ +85	
LCP1G050M0R2	0603										
LCP0G120M0R2	0402	12	360		50	100					500
LCP1G120M0R2	0603										
LCP0G180M0R2	0402	18	390		50	100					
LCP1G180M0R2	0603										
LCP0G200M0R2	0402	20	420		50	100					
LCP1G200M0R2	0603										
LCP0G240M0R2	0402	24									
LCP1G240M0R2	0603										

Note *1: The clamping voltage follows IEC 61000-4-2, level 4 8 kV contact discharge and shall be measured at 30 ns after initiation of pulse.

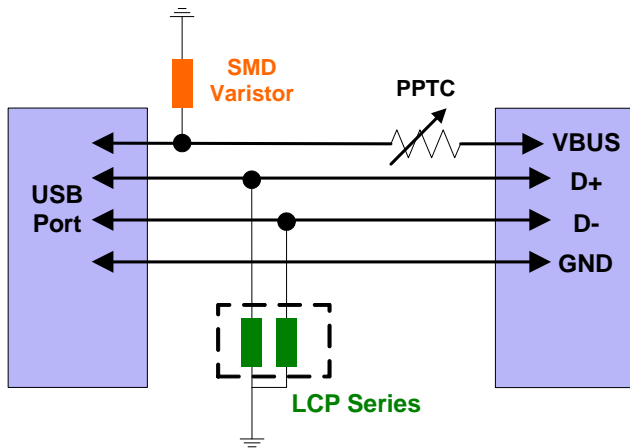
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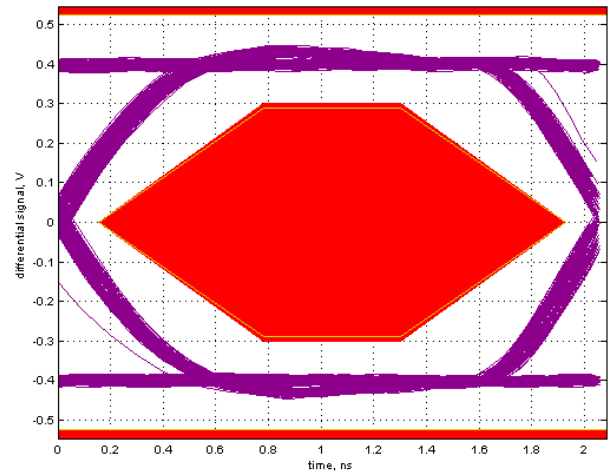
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Typical Application Circuit

USB 2.0 Protection

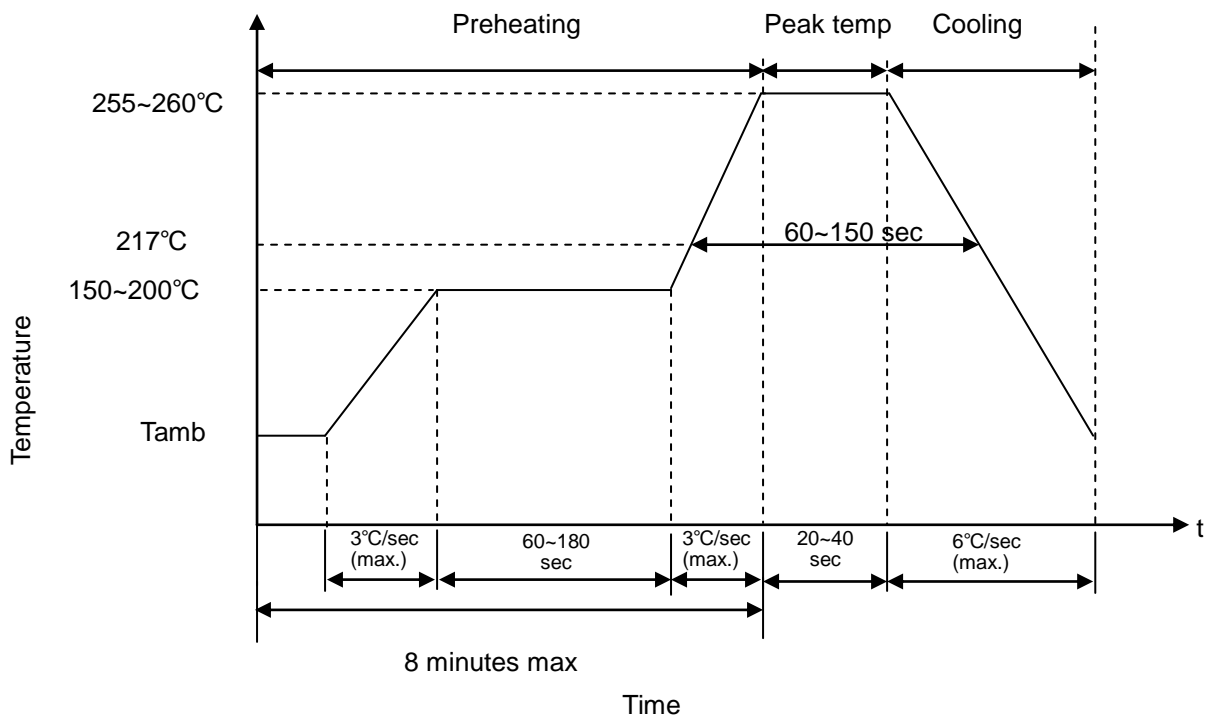


Eye Diagram



Soldering Recommendation

IR-Reflow Soldering Profile



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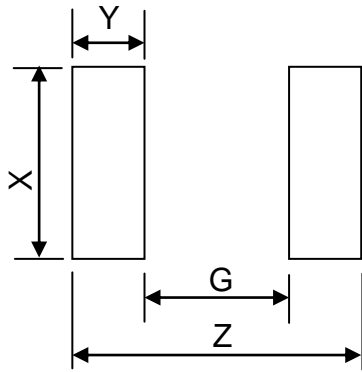
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Recommended Reworking Conditions with Soldering Iron

Item	Conditions
Temperature of Soldering Iron-tip	360°C (max.)
Soldering Time	3 sec (max.)
Diameter of Soldering Iron-tip	Φ3mm (max.)

Caution: Please do not directly touch the component surface with soldering iron to avoid its damage.

Recommended Soldering Pad Dimensions

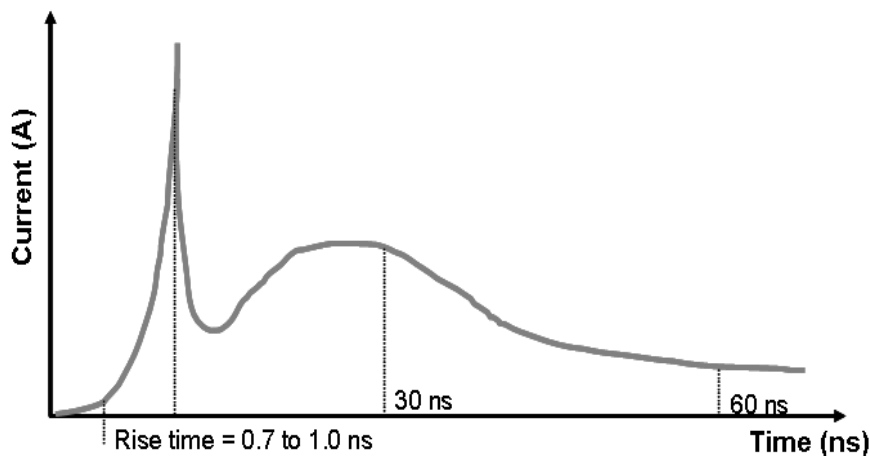


Size (EIA)	Z (mm)	G (mm)	X (mm)	Y (mm)
0402	1.7	0.5	0.6	0.6
0603	3.0	1.0	1.0	1.0

Electrostatic Discharge-ESD Reliability

Severity Level	Discharge Voltage	Initial Current	30 ns Current	60 ns Current
1	2 kV	7.5 A	4A	2A
2	4 kV	15.0 A	8A	4A
3	6 kV	22.5 A	12A	6A
4	8 kV	30.0 A	16A	8A

* Follow IEC61000-4-2



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■ Reliability

Item	Standard	Test conditions / Methods	Specifications															
Resistance to Soldering Heat	IEC 60068-2-58	$260 \pm 5 \text{ }^{\circ}\text{C}$, $10 \pm 1 \text{ sec}$	$I_L \leq 10\mu\text{A}$ No visible damage															
High Temperature Load	IEC 61051-1	$85 \pm 2 \text{ }^{\circ}\text{C}$, $1000 \pm 24 \text{ hrs}$ at V_{DC}	$I_L \leq 10\mu\text{A}$ No visible damage															
Damp Heat Load, Steady State	IEC 61051-1	$40 \pm 2^{\circ}\text{C}$, 90-95%RH, $1000 \pm 24 \text{ hrs}$, at V_{DC}	$I_L \leq 10\mu\text{A}$ No visible damage															
Rapid Change of Temperature	IEC 61051-1	<p>The conditions shown below shall be repeated 5 cycles</p> <table border="1"><thead><tr><th>Step</th><th>Temperature ($^{\circ}\text{C}$)</th><th>Period (minutes)</th></tr></thead><tbody><tr><td>1</td><td>-40 ± 5</td><td>30 ± 3</td></tr><tr><td>2</td><td>Room temperature</td><td>5 ± 3</td></tr><tr><td>3</td><td>85 ± 5</td><td>30 ± 3</td></tr><tr><td>4</td><td>Room temperature</td><td>5 ± 3</td></tr></tbody></table>	Step	Temperature ($^{\circ}\text{C}$)	Period (minutes)	1	-40 ± 5	30 ± 3	2	Room temperature	5 ± 3	3	85 ± 5	30 ± 3	4	Room temperature	5 ± 3	$I_L \leq 10\mu\text{A}$ No visible damage
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2	Room temperature	5 ± 3																
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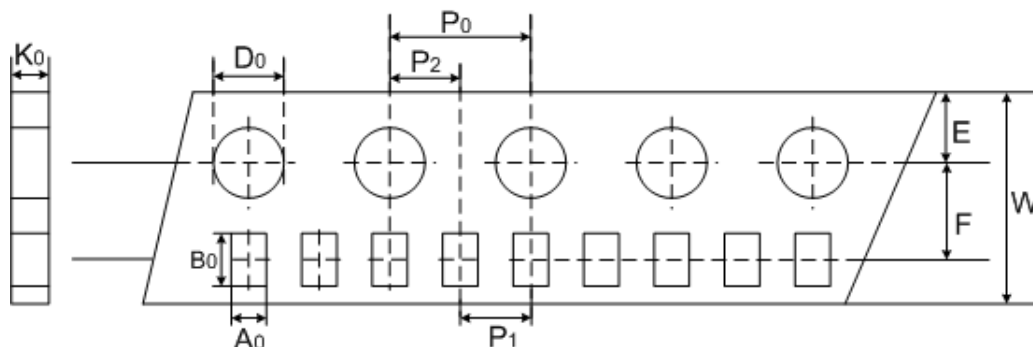
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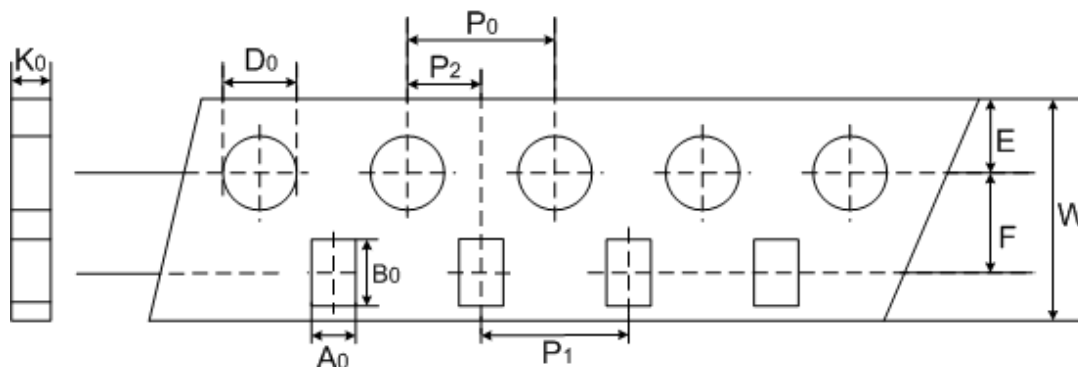
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■ Packaging

● Taping Specification



Index Type	A_0	B_0	W	E	F	P_1	P_2	P_0	D_0	K_0
0402	0.68	1.13	8	1.75	3.5	2	2	4	1.55	0.40



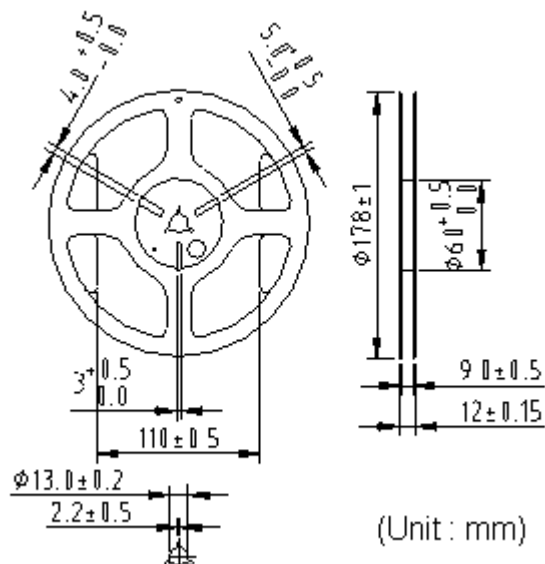
Index Type	A_0	B_0	W	E	F	P_1	P_2	P_0	D_0	K_0
0603	1.1	1.9	8	1.75	3.5	4	2	4	1.55	0.95

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■ Quantity



● Reel Packing

Type	Quantity (pcs/reel)
0402	10,000
0603	4,000

■ Warehouse Storage Conditions of Products

● Storage Conditions :

1. Storage Temperature : -10°C~+40°C
2. Relative Humidity : ≤75%RH
3. Keep away from corrosive atmosphere and sunlight.

● Period of Storage: 1 year.