

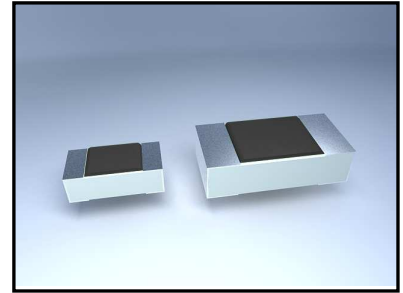
ESD Suppressor : LCP Series

Ultra-Low Capacitance ESD Suppressor for High-Speed Application



■ Features

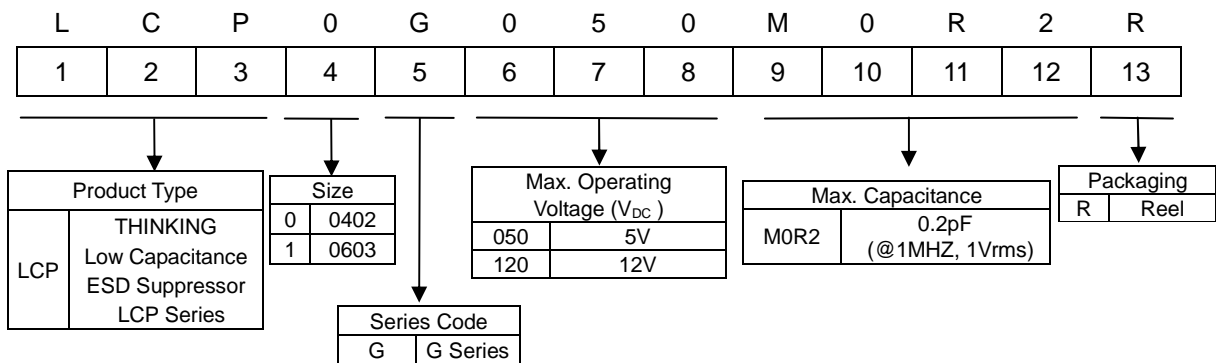
1. RoHS compliant and lead-free
2. EIA size 0402, 0603
3. Ultra-low capacitance (<math><0.2\text{pF}</math>) and low leakage current (<math><0.05\mu\text{A}</math>)
4. Fast response time (<math><1\text{ns}</math>)
5. Bi-directional device
6. Rate for ESD protection and pass IEC 61000-4-2 level 4 test



■ 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

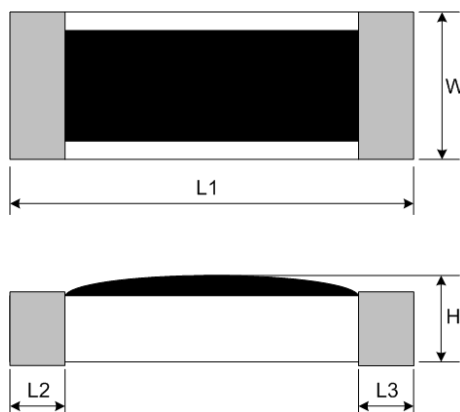


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Structures and Dimensions



(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.				
LCP0G050M0R2R	0402	5	300	0.2	30	100	0.05	1000	>100	-40 ~ +85
LCP1G050M0R2R	0603									
LCP0G120M0R2	0402	12	360							
LCP1G120M0R2	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.

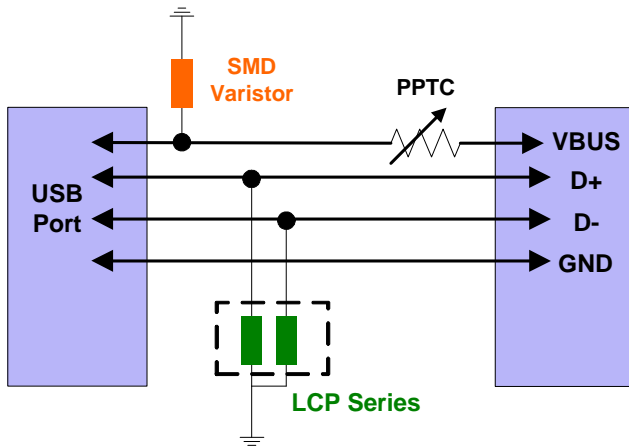
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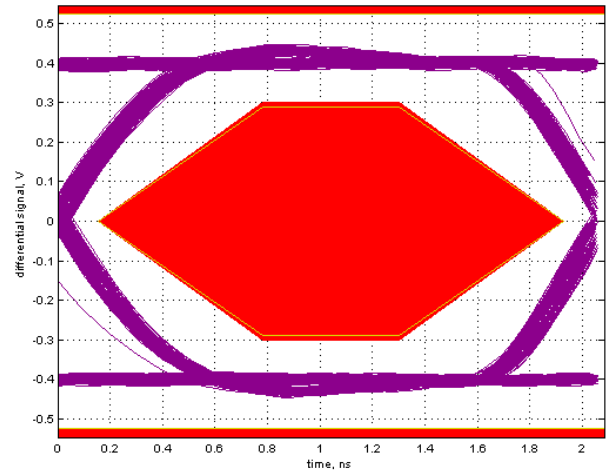
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Typical Application Circuit

USB 2.0 Protection

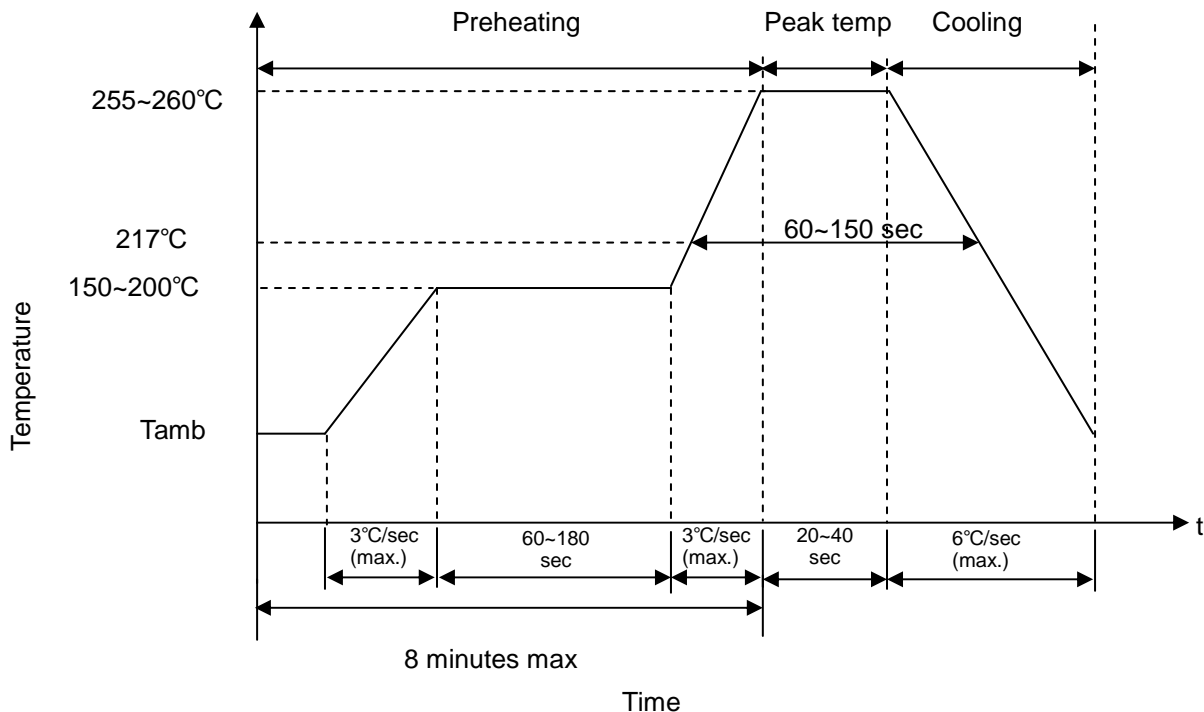


Eye Diagram



Soldering Recommendation

IR-Reflow Soldering Profile



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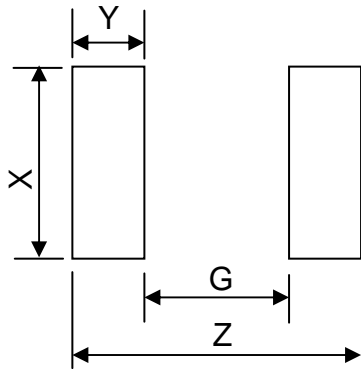
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■ Recommended Reworking Conditions with Soldering Iron

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

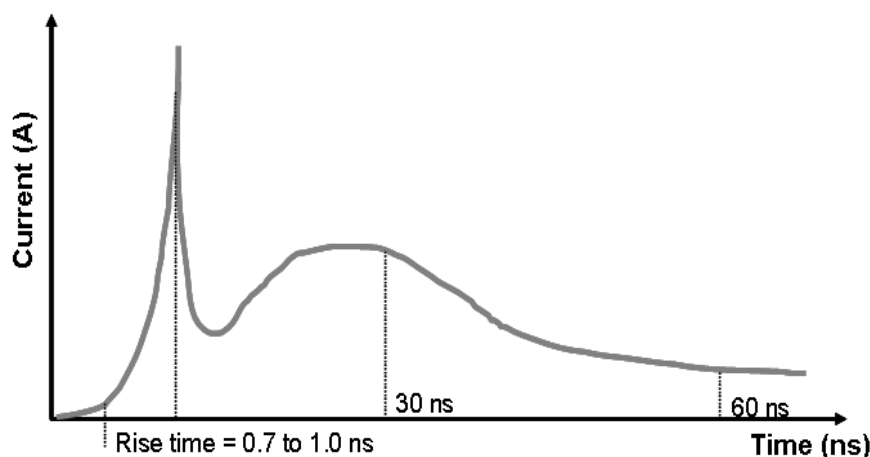


Size (EIA)	Z (mm)	G (mm)	X (mm)	Y (mm)
0402	1.7	0.5	0.6	0.6
0603	3.0	1.0	1.0	1.0

■ 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 ± 5 °C, 10 ± 1 sec	$I_L \leq 10\mu\text{A}$ No visible damage															
High Temperature Load	IEC 61051-1	85 ± 2 °C, 1000 ± 24 hrs at V_{DC}	$I_L \leq 10\mu\text{A}$ No visible damage															
Damp Heat Load, Steady State	IEC 61051-1	40 ± 2 °C, 90-95%RH, 1000 ± 24 hrs, at V_{DC}	$I_L \leq 10\mu\text{A}$ No visible damage															
Rapid Change of Temperature	IEC 61051-1	The conditions shown below shall be repeated 5 cycles <table border="1"><thead><tr><th>Step</th><th>Temperature (°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 (°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
Step	Temperature (°C)	Period (minutes)																
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2	Room temperature	5 ± 3																
3	85 ± 5	30 ± 3																
4	Room temperature	5 ± 3																

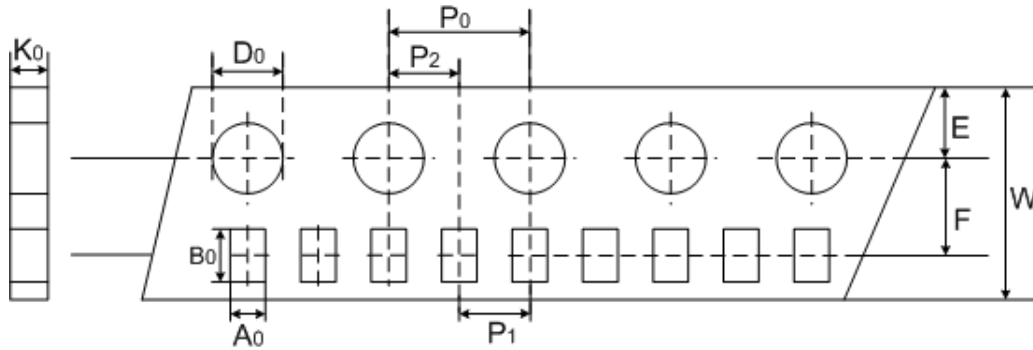
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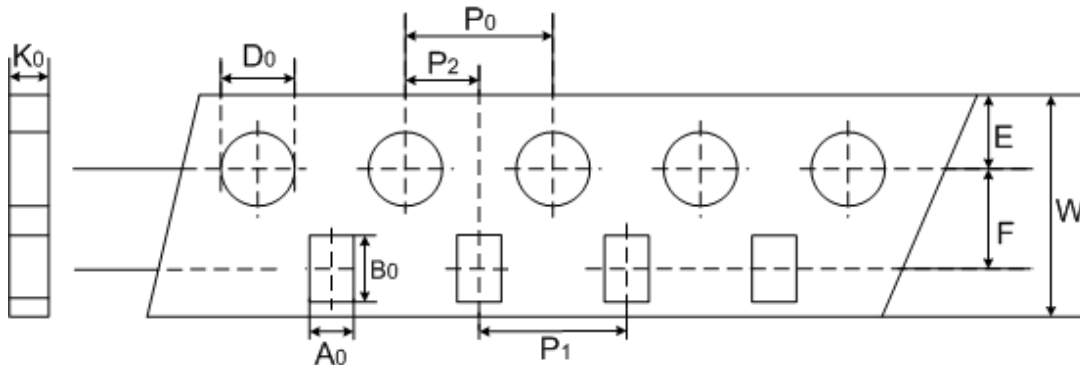
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■ Packaging

● Taping Specification



Index Type	A ₀	B ₀	W	E	F	P ₁	P ₂	P ₀	D ₀	K ₀
0402	±0.05	±0.12	±0.2	±0.1	±0.05	±0.1	±0.05	±0.1	±0.1	±0.1



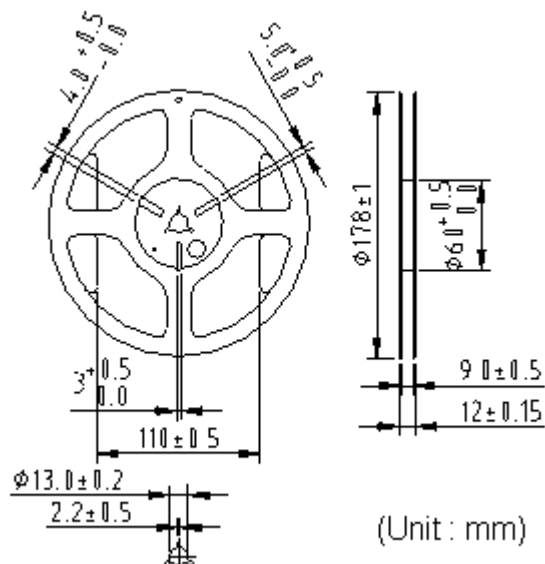
Index Type	A ₀	B ₀	W	E	F	P ₁	P ₂	P ₀	D ₀	K ₀
0603	±0.2	±0.2	±0.2	±0.1	±0.05	±0.1	±0.05	±0.1	±0.1	±0.1

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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.