

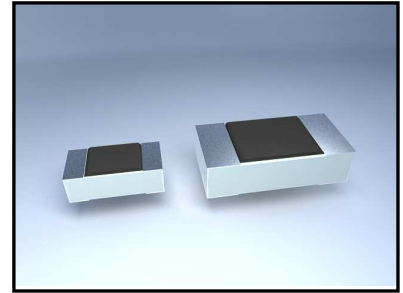
ESD Protector : LCP Series

Ultra-Low Capacitance ESD Suppressor for High-Speed Application



■ Features

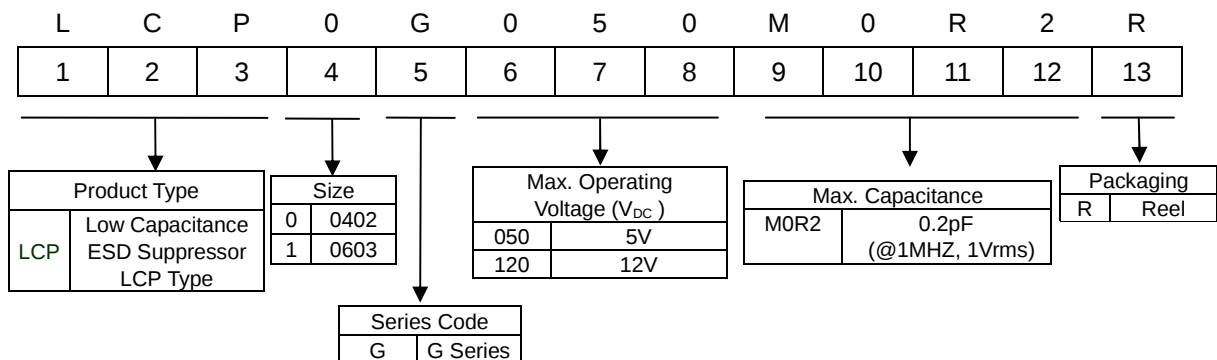
1. RoHS compliant and lead-free
2. EIA size 0402, 0603
3. Ultra-low capacitance ($<0.2\text{pF}$) and low leakage current ($<0.05\mu\text{A}$)
4. Fast response time ($<1\text{ns}$)
5. Single-line, bi-directional device
6. Rate for ESD protection and pass IEC 61000-4-2 level 4 test



■ 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

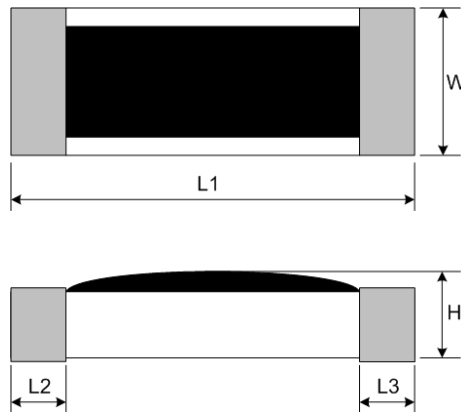


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■ Structure and Dimensions



(Unit : mm)

Part No.	Size (EIA)	L1	W	H	L2 and L3
LCP0G	0402	1.00 ± 0.15	0.50 ± 0.10	0.35 ± 0.1	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)	Vc (V)		I _L (μA)	Times	R(MΩ)	(℃)
					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, level4 8 kV contact discharge and shall be measured at 30 ns after initiation of pulse.

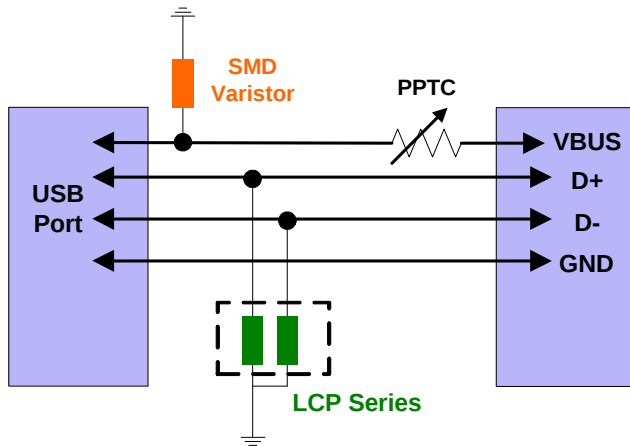
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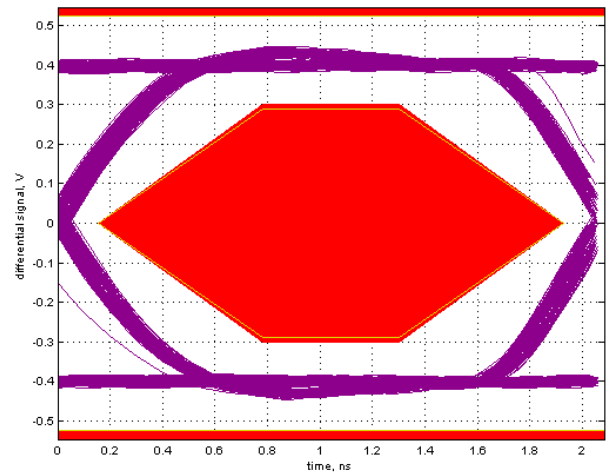


■ Typical Application Circuit

USB 2.0 Protection

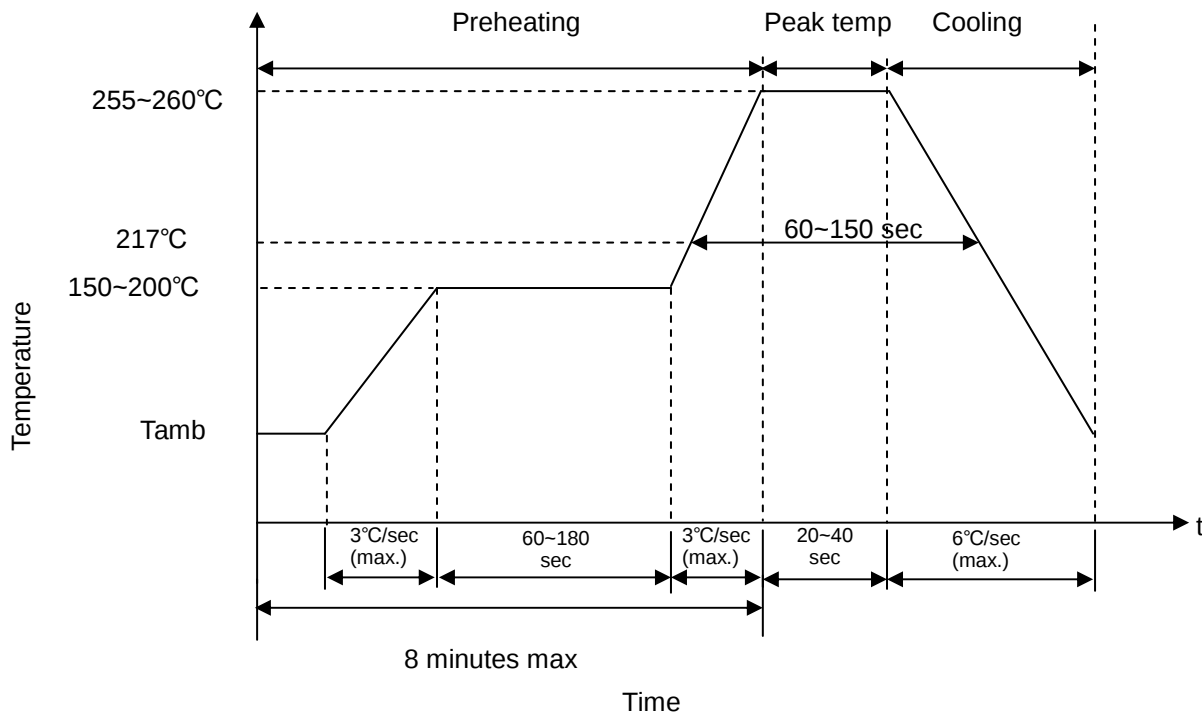


■ Eye Diagram



■ Soldering Recommendation

● IR-Reflow Soldering Profile



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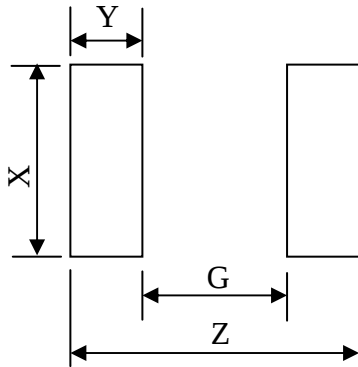


■ Recommended Reworking Conditions with Soldering Iron

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

Caution: Do not touch the component surface with soldering iron directly to prevent it from damage.

■ Recommended Soldering Pad Dimensions

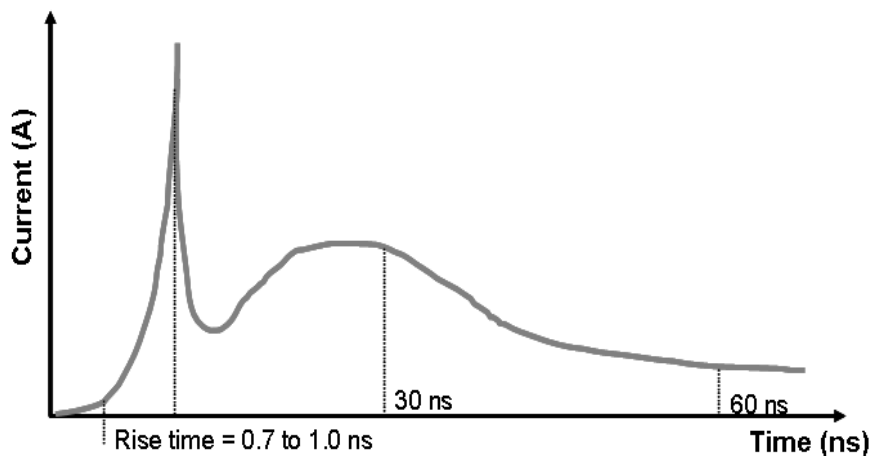


Size (EIA)	Z (mm)	G (mm)	X (mm)	Y (mm)
0402	1.7	0.5	0.6	0.6
0603	3.0	1.0	1.0	1.0

■ 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	$I_L \leq 10\mu A$ No visible damage		
High Temperature Load	IEC 1051-1	85 ± 2 °C , 1000 ± 24 hrs at V _{DC}	$I_L \leq 10\mu A$ No visible damage		
Damp Heat Load, Steady State	IEC 1051-1	40±2°C , 90-95%RH, 1000±24hrs, at V _{DC}	$I_L \leq 10\mu A$ No visible damage		
Rapid Change of Temperature	IEC 1051-1	The conditions shown below shall be repeated 5 cycles		$I_L \leq 10\mu A$ No visible damage	
		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

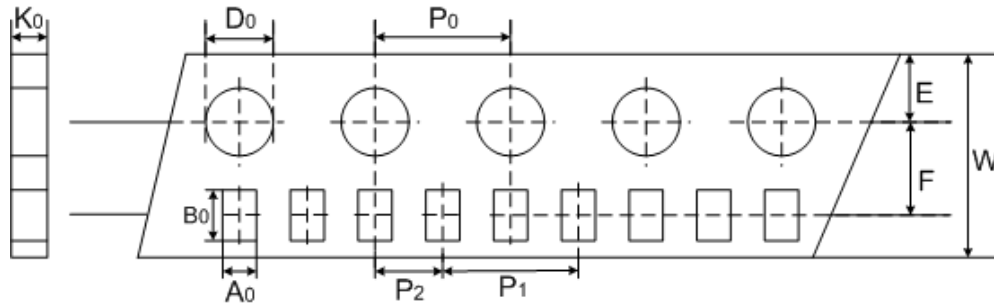
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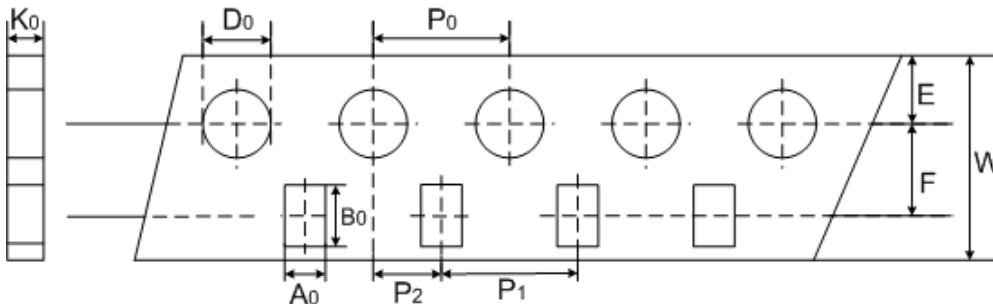
■ Packaging

● Taping Specification



(Unit : mm)

Index	A ₀	B ₀	W	E	F	P ₁	P ₂	P ₀	D ₀	K ₀
Type	±0.1	±0.12	±0.2	±0.1	±0.05	±0.1	±0.05	±0.1	±0.1	±0.1
0402	0.68	1.13	8	1.75	3.5	4	2	4	1.55	0.40



(Unit : mm)

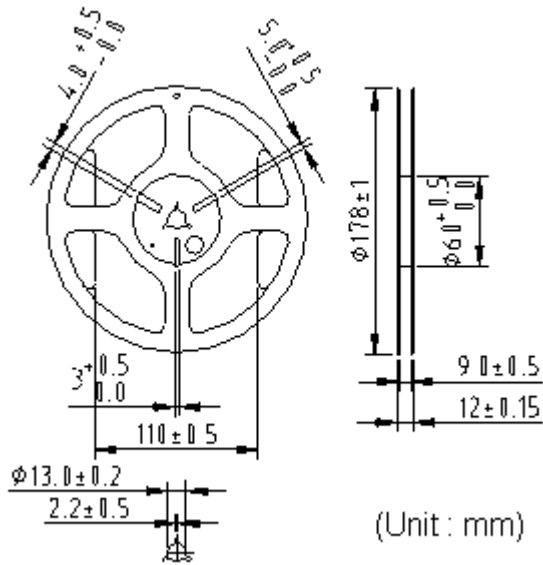
Index	A ₀	B ₀	W	E	F	P ₁	P ₂	P ₀	D ₀	K ₀
Type	±0.2	±0.2	±0.2	±0.1	±0.05	±0.1	±0.05	±0.1	±0.1	±0.1
0603	1.1	1.9	8	1.75	3.5	4	2	4	1.55	0.59

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■ Quantity



● Reel Packing

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

■ Storage Conditions of Products

● Storage Conditions :

1. Storage Temperature : $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
2. Relative Humidity : $\leq 75\% \text{RH}$
3. Keep away from corrosive atmosphere and sunlight.

● Period of Storage: 1 year.