SMD Common Mode Filter (USB2.0) / CML Series

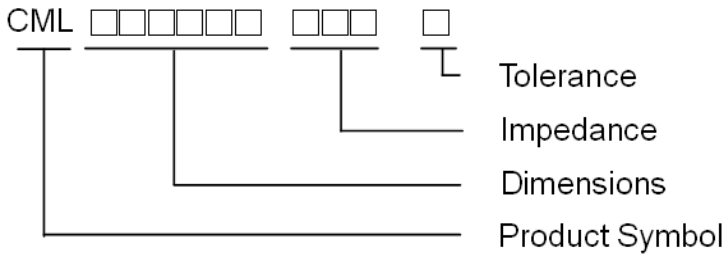
.Features:

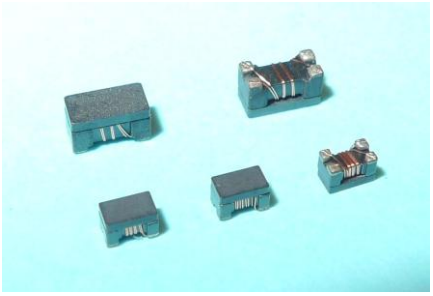
1. High common mode impedance at high frequency effects excellent noise suppression performance.(在高頻的共模阻抗具有很好的雜訊抑制表現。)
2. CML series realizes small size and low profile.(CML具小尺寸及扁薄外觀。)
3. The products contain no lead and also support lead-free soldering.(產品無鉛適合無鉛銲錫。)

.Applications:

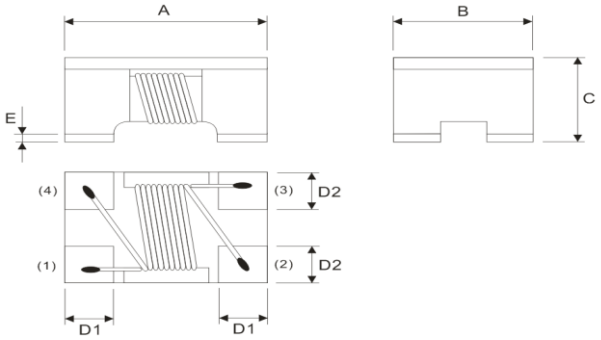
Common mode noise suppression of signal lines in high speed and high density digital equipment such as personal computers and peripherals.

.Product Identification：

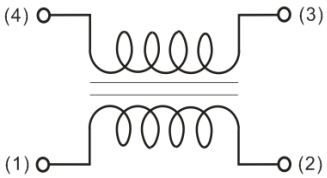




.Shape and Dimension



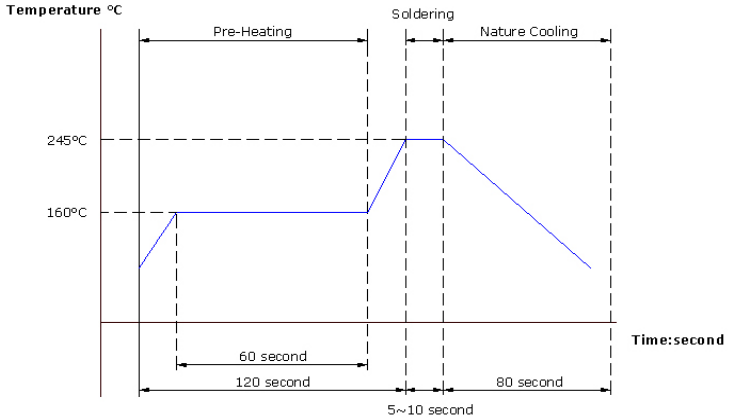
.Schematic



Dimensions in mm

TYPE	A(mm)	B(mm)	C(mm)	D1(mm)	D2(mm)	E(mm)
CML201212	2.0±0.2	1.2±0.2	1.2±0.2	0.45(typ.)	0.40(typ.)	0.17(typ.)
CML321620	3.2±0.2	1.6±0.2	1.8±0.2	0.60(typ.)	0.60(typ.)	0.17(typ.)

.Recommended Reflow



Wire-Wound Chip Coils Lead-Free IR Reflow Temperature Profile

SMD Common Mode Filter (USB2.0) / CML Series

. Electrical Characteristics（CML201212 TYPE）

Part No.	Impedance (Ω)	Test frequency (MHz)	DCR (Ω) Max	IDC (mA) Max	Rated Voltage (Vdc)	Insulation Resistance (MΩ)(min)	Withstand Voltage (Vdc)
CML201212T-250□	25	100	0.20	500	50	10	125
CML201212T-300□	30	100	0.20	450	50	10	125
CML201212T-400□	40	100	0.12	500	50	10	125
CML201212T-420□	42	100	0.12	500	50	10	125
CML201212T-500□	50	100	0.20	500	50	10	125
CML201212T-600□	60	100	0.30	500	50	10	125
CML201212T-670□	67	100	0.25	400	50	10	125
CML201212T-750□	75	100	0.30	400	50	10	125
CML201212T-900□	90	100	0.30	400	50	10	125
CML201212T-121□	120	100	0.30	370	50	10	125
CML201212T-161□	160	100	0.30	340	50	10	125
CML201212T-181□	180	100	0.35	330	50	10	125
CML201212T-201□	200	100	0.35	330	50	10	125
CML201212T-221□	220	100	0.35	330	50	10	125
CML201212T-261□	260	100	0.40	300	50	10	125
CML201212T-301□	300	100	0.50	300	50	10	125
CML201212T-331□	330	100	0.50	300	50	10	125
CML201212T-371□	370	100	0.40	280	50	10	125
CML201212T-501□	500	100	0.500	250	50	10	125
CML201212T-601□	600	100	0.375	250	50	10	125
CML201212T-671□	670	100	0.60	150	50	10	125
CML201212T-681□	680	100	0.60	170	50	10	125
CML201212T-751□	750	100	0.60	170	50	10	125
CML201212T-801□	800	100	0.80	120	50	10	125
CML201212T-901□	900	100	0.80	120	50	10	125
CML201212T-921□	920	100	0.95	160	50	10	125
CML201212T-102□	1000	100	0.80	100	50	10	125
CML201212T-222□	2200	100	1.40	100	50	10	125
CML201212T-392□	390	100	1.80	80	50	10	125

.Electrical Characteristics（CML321620 TYPE）

Part No.	Impedance (Ω)	Test frequency (MHz)	DCR (Ω) Max	IDC (mA) Max	Rated Voltage (Vdc)	Insulation Resistance (MΩ)(min)	Withstand Voltage (Vdc)
CML321620T-370□	37	100	0.12	1000	50	10	125
CML321620T-500□	50	100	0.20	500	50	10	125
CML321620T-600□	60	100	0.30	500	50	10	125
CML321620T-670□	67	100	0.30	500	50	10	125
CML321620T-750□	75	100	0.30	500	50	10	125
CML321620T-900□	90	100	0.30	500	50	10	125

SMD Common Mode Filter (USB2.0) / CML Series

Part No.	Impedance (Ω)	Test frequency (MHz)	DCR (Ω) Max	IDC (mA) Max	Rated Voltage (Vdc)	Insulation Resistance (MΩ)(min)	Withstand Voltage (Vdc)
CML321620T-101□	100	100	0.30	500	50	10	125
CML321620T-121□	120	100	0.30	370	50	10	125
CML321620T-161□	160	100	0.40	340	50	10	125
CML321620T-181□	180	100	0.40	340	50	10	125
CML321620T-261□	260	100	0.50	310	50	10	125
CML321620T-281□	280	100	0.50	310	50	10	125
CML321620T-361□	360	100	0.50	280	50	10	125
CML321620T-371□	370	100	0.50	280	50	10	125
CML321620T-431□	430	100	0.60	280	50	10	125
CML321620T-601□	600	100	0.80	260	50	10	125
CML321620T-102□	1000	100	1.00	230	50	10	125
CML321620T-152□	1500	100	1.00	200	50	10	125
CML321620T-222□	2200	100	1.20	200	50	10	125

NOTE:

1. Operating temperature range -40℃～105℃
2. IDC for Inductance drop 10% from its value without current.
3. □Tolerance：J=5%；K=10%；M=20%；Y=25%；N=30%

SMD Common Mode Filter (USB2.0) / CML Series

. Reliability and Test Conditions(可靠性測試條件)

1-1.Mechanical Performance

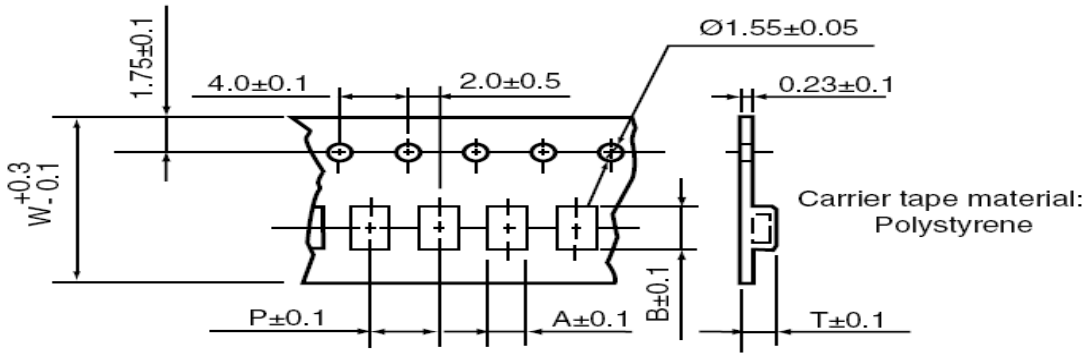
Item	Specification	Test Method
Resistance to Soldering Heat	Appearance: No damage	1. The device should be reflow soldered on PCB (peak 260℃±5℃ for 10 seconds) 2. Solder Composition: Sn/Ag3.0/Cu0.5 3. Test time: 6 minutes
Solder ability	The electrodes shall be at least 90% covered with new solder coating	1.Pre-heating: 150℃, 1min 2. Solder Composition: Sn/Ag3.0/Cu0.5 3. Solder Temperature: 245±5℃. 4. Immersion Time: 4±1 sec.
Commponent Adhesion (Push Test)	2 Lbs	The device should be reflow soldered (245±5℃ For 10 seconds) to a tinned copper substrate. A force guauge should be applied to the side of the component. The device must withstand a minimum force of 2 pounds without a failure of the termination attached to component.

1-2.Environmental Performance

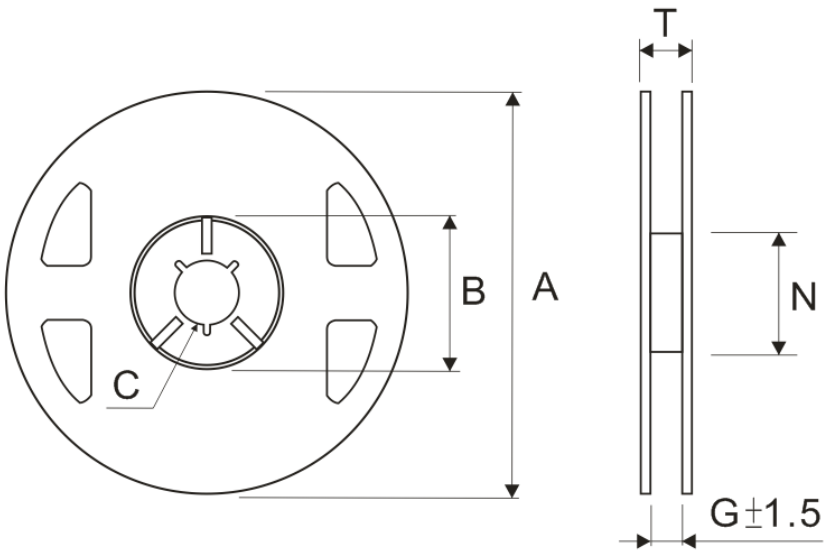
<table>
<tr><th>Item</th><th>Specification</th><th>Test Method</th></tr>
<tr><td>Temperature Cycle</td><td rowspan="4">Appearance: No damage
Impedance: within±20% of initial value</td><td>One cycle:
<table>
<tr><th>Step</th><th>Temperature (℃)</th><th>Time (min)</th></tr>
<tr><td>1</td><td>-40±3</td><td>30</td></tr>
<tr><td>2</td><td>25±2</td><td>3</td></tr>
<tr><td>3</td><td>105±3</td><td>30</td></tr>
<tr><td>4</td><td>25±2</td><td>3</td></tr>
</table>
Total: 5cycles
Measured after exposure in the room condition for 1hrs</td></tr>
<tr><td>High Temperature Resistance</td><td>Temperature: 105±3℃
Time: 50hrs
Measured after exposure in the room condition for 1hrs</td></tr>
<tr><td>Low Temperature Resistance</td><td>Temperature: -40±3℃
Time: 50hrs
Measured after exposure in the room condition for 1hrs</td></tr>
<tr><td>Humidity Resistance</td><td>Temperature: 85±2℃
Relative Humidity: 90 ~ 95% / Time: 100hrs
Measured after exposure in the room condition for 1hrs</td></tr>
<tr><td>High Temperature Load Life</td><td rowspan="2">There should be no evidence of short or open circle</td><td>Temperature: 105±3℃
Load: Allowed DC Current
Time: 500Hrs</td></tr>
<tr><td>Humidity Load Life</td><td>Temperature:85±2℃
Relative Humidity: 90~95%
Load: Allowed DC Current
Time: 500Hrs</td></tr>
</table>

SMD Common Mode Filter (USB2.0) / CML Series

.Packing Specifications



TYPE	Packaging Quantity		Tape Dimension(mm)				
	Pcs / Reel	Inner box	A	B	W	P	T
CML201212	2000	10000	1.5	2.25	8	4	1.45
CML321620	2000	10000	1.76	3.47	8	4	2.05



TYPE	Reel Dimension(mm)					
	A	B	C	G	N	T
CML201212	178±2	21.0±0.8	13.0±0.8	9.5	60	12
CML321620	178±2	21.0±0.8	13.0±0.8	9.5	60	12