

## High Current Common Mode Choke



### FEATURES

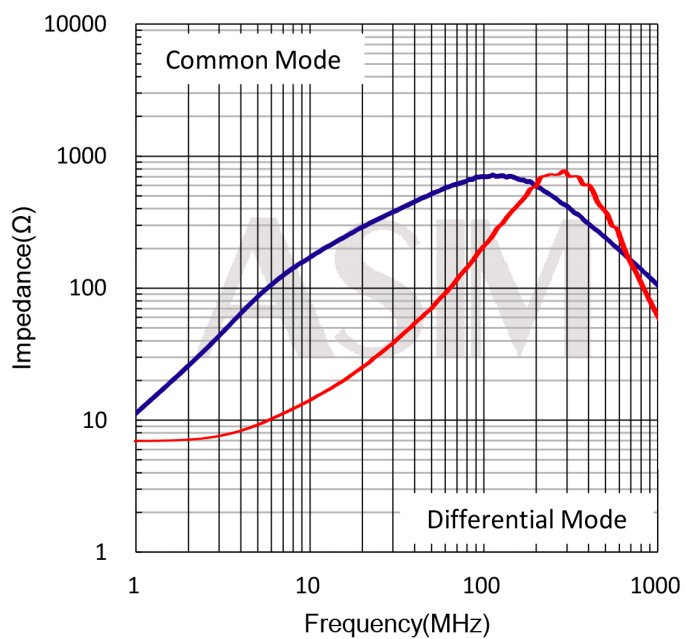
- Surface mountable (multiple case sizes), high current common mode choke for DC power line
- Base terminals are treated, allows for easy mounting on PCB
- Paired wire coil for high stability
- Optimized for transmission of high quality signals
- Operating temperature: -40 °C to +125 °C
- Rated Current: Based on temp. rise;  $\Delta T$ : 40 °C, typical
- Material categorization: For definitions of compliance please see

### APPLICATIONS

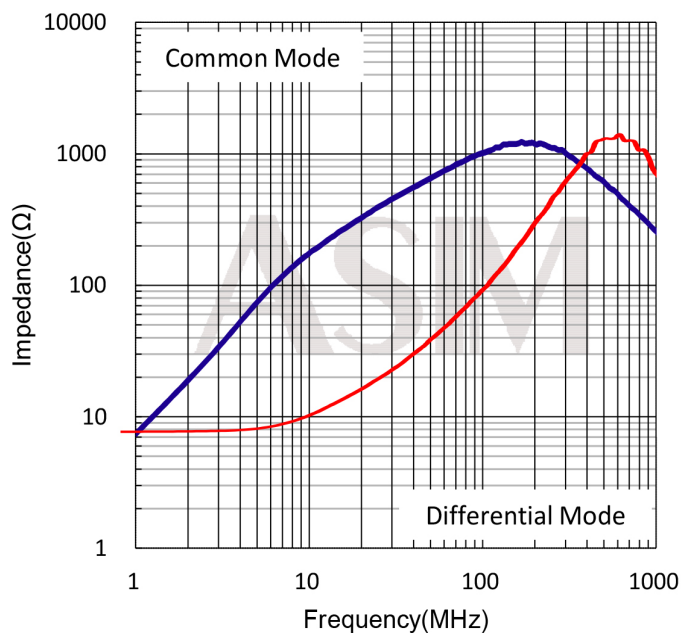
- LAN's, telephones, personal computers
- CD-ROM drives, electronic games
- Other electronic devices

STANDARD ELECTRICAL SPECIFICATIONS					
PART NUMBER	COMMON MODE IMPEDANCE AT 100 MHz ( $\Omega$ )	RATED VOLTAGE MAX. ( $V_{DC}$ )	RATED CURRENT MAX. (mA)	DC RESISTANCE MAX. ( $\Omega$ )	INSULATION RESISTANCE MIN. (M $\Omega$ )
CMF2K701WIT	700 $\pm$ 25%	50	5000	0.010	10
CMF2K102WIT	1000 $\pm$ 25%	50	4000	0.013	10
CMF2K272WIT	2700 $\pm$ 25%	50	2000	0.086	10

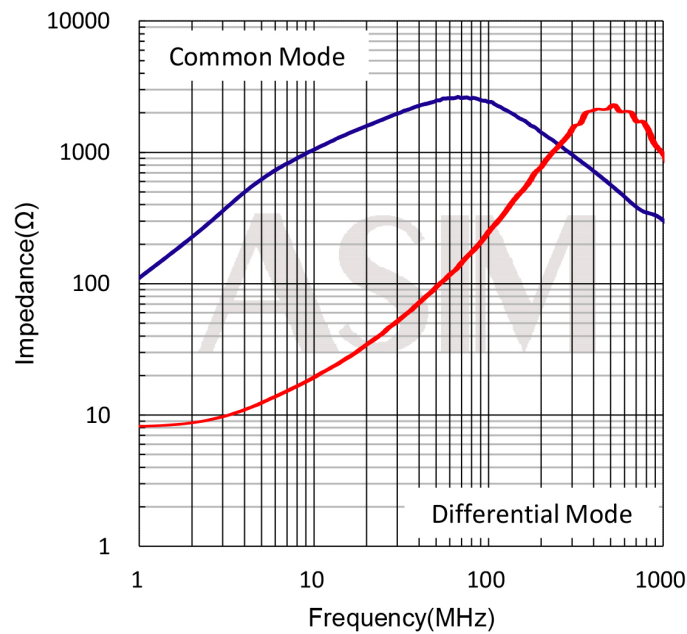
## PERFORMANCE GRAPHS: INDUCTANCE AND Q VS. FREQUENCY



CMF2K701WIT

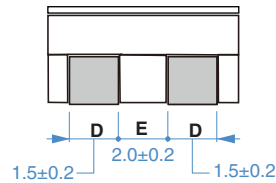
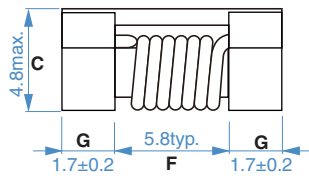
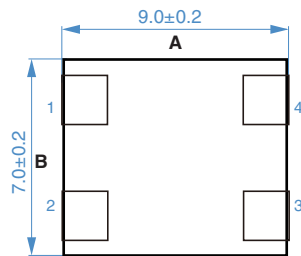


CMF2K102WIT

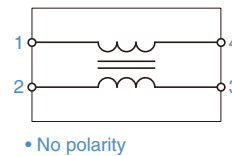
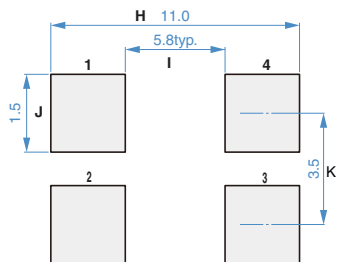


CMF2K272WIT

## DIMENSIONS in inches [millimeters]

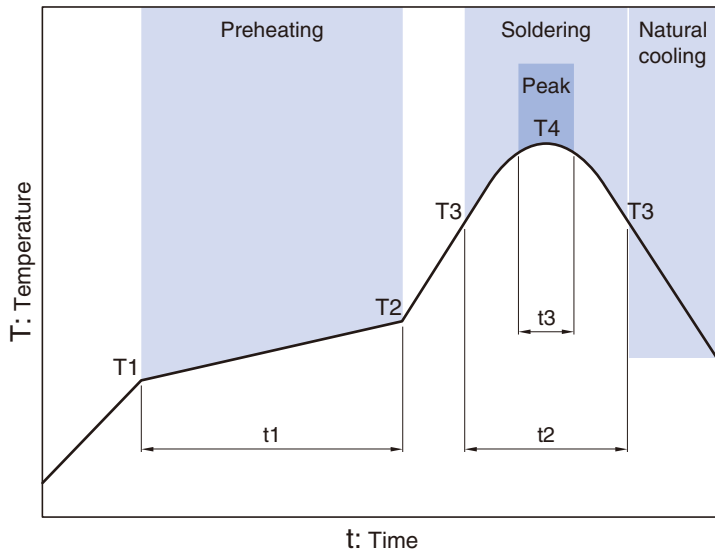


Dimensions in mm							
PART NUMBER	A	B	C	D	E	F	G
CMF2K Series	0.354 ± 0.008 [9.0 ± 0.2]	0.276 ± 0.008 [7.0 ± 0.2]	0.189 [4.8] max.	0.059 ± 0.008 [1.5 ± 0.2]	0.079 ± 0.008 [2.0 ± 0.2]	0.228 [5.8] typ.	0.059 ± 0.008 [1.7 ± 0.2]



Dimensions in mm				
PART NUMBER	H	I	J	K
CMF2I Series	0.433 [11.0]	0.228 [5.8typ.]	0.059 [1.5]	0.138 [3.5]

## RECOMMENDED REFLOW PROFILE



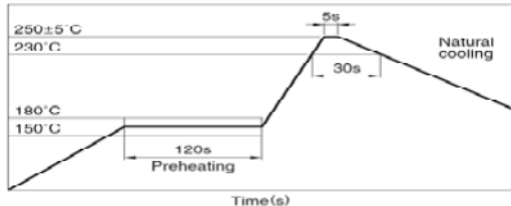
Preheating			Soldering		Peak	
Temp.	Time		Temp.	Time	Temp.	Time
T1	T2	t1	T3	t2	T4	t3
150°C	180°C	60 to 120s	230°C	25 to 35s	250°C	5s

## RELIABILITY TEST METHOD

### ◆ ELECTRIC

NO.	Test items	Standard	Experiment Method
1	Temperature characteristics	$\Delta L/L \ 20^{\circ}\text{C} \leq \pm 10\%$	The test should be done after the sample has stabilized in the ring The temperature of the product is -40 to +125 °C, and the L ( $\Delta L$ ) value of the product is the same as the original L value. Suitable for normal temperature and humidity should be $\Delta L / L \ 20^{\circ}\text{C} \leq \pm 10\%$ .
2	Load test	The product must not have any damage, such as smoke or sparks	1.2 times the rated current, the time is 5 minutes

## 6.2 ENVIRONMENTAL CHARACTERISTICS

NO.	Test items	Standard	Experiment Method								
1	Reflow soldering	Do not have any damage or problems	<p>Reflow of temperature distribution Before the heat: 150-180 °C, Times 60 to 120sec Peak temperature: 250 ± 5 °C, Times 5 sec Hold temperature: 230 ± 5 °C, Times 30 ± 5 sec</p> 								
2	Solderability	Welding area of more than 90%	The solder surface is immersed in flux and then immersed in a furnace at 235 ± 5 °C for 5 seconds								
3	Low temperature storage	$\Delta L / L0 \leq \pm 10\%$ , there should be no mechanical damage	The sample should be left for 96 ± 4 hours at a temperature of -40 ± 3 °C and returned to the normal temperature range of 1 hour after completion of the test. ) 90-95%.								
4	High temperature storage	$\Delta L / L0 \leq \pm 10\%$ , there should be no mechanical damage	The sample should be left for 96 ± 4 hours at a temperature of 125 ± 3 °C. The test should be carried out after returning to normal temperature range for 1 hour.								
5	Constant hot and humid	$\Delta L / L0 \leq \pm 10\%$ , there should be no mechanical damage.	Samples should be left for 96 ± 4 hours at 60 ± 2 °C and 90 °C to 90% humidity (RH). The test is resumed after 1 hour in the normal temperature range.								
6	Temperature cycle	1, no visible mechanical damage. 2, the value of change is less than 10%. 3, the resistance value of less than 5%	In the -25 °C to +85 °C between the respective keep 15min, transit time ≤1min, the number of cycles 5 times, recovery time: 24h test finished (recovery time at least 4h)								
7	vibration	$\Delta L / L0 \leq \pm 10\%$ There should be no mechanical damage	The sample should be soldered to the printed circuit board When the vibration has an amplitude and 1.5 mm Frequency from 10-55Hz / 1 minute, repeated should be applied to three directions (X, Y, Z) for 2 hours, a total of 6 hours								
8	Impact resistance (MIL-STD-202G Method 213B)	Change in inductance: within ± 10% DC resistance change: ± 10% within the appearance of no obvious abnormalities, should not have mechanical damage.	<p>The test sample shall be soldered to the test substrate by reflow soldering. Then, follow the following test conditions.</p> <table><tr><th>Pulse</th><th>Half sine shock</th></tr><tr><td>Acceleration</td><td>980 m/s<sup>2</sup>(100g)</td></tr><tr><td>Nominal pulse duration</td><td>6 ms</td></tr><tr><td>Speed change</td><td>3.75 m/s</td></tr></table> <p>Recovery: 2 hours of recovery in standard condition and subsequent testing within 48 hours.</p>	Pulse	Half sine shock	Acceleration	980 m/s <sup>2</sup> (100g)	Nominal pulse duration	6 ms	Speed change	3.75 m/s
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Acceleration	980 m/s <sup>2</sup> (100g)										
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Speed change	3.75 m/s										

9	Thermal shock (MIL-STD-202G Method 107G)	Change in inductance: within $\pm 10\%$ DC resistance change: $\pm 10\%$ within the appearance of no obvious abnormalities, should not have mechanical damage.	<p>The test sample shall be soldered to the test substrate by reflow soldering. Test sample according to the specified time Are placed at a specific temperature, as shown in the table below, from step 1 to step 4.</p> <table><tr><th colspan="3">1 cycle condition</th></tr><tr><th>Step</th><th>Temperature (<math>^{\circ}\text{C}</math>)</th><th>Time (minute)</th></tr><tr><td>1</td><td><math>-55 \pm 3</math></td><td><math>30 \pm 3</math></td></tr><tr><td>2</td><td>Room temperature</td><td>3 or less</td></tr><tr><td>3</td><td><math>-125 \pm 3</math></td><td><math>30 \pm 3</math></td></tr><tr><td>4</td><td>Room temperature</td><td>3 or less</td></tr></table> <p>Recovery: 2 hours of recovery in standard condition and subsequent testing within 48 hours.</p>	1 cycle condition			Step	Temperature ( $^{\circ}\text{C}$ )	Time (minute)	1	$-55 \pm 3$	$30 \pm 3$	2	Room temperature	3 or less	3	$-125 \pm 3$	$30 \pm 3$	4	Room temperature	3 or less
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3	$-125 \pm 3$	$30 \pm 3$																			
4	Room temperature	3 or less																			
10	Wet heat resistance (MIL-STD-202G Method 106G)	Change in inductance: within $\pm 10\%$ DC resistance change: $\pm 10\%$ within the appearance of no obvious abnormalities, should not have mechanical damage.	<p>The test sample shall be soldered to the test substrate by reflow soldering. Test samples must be placed in a constant temperature and humidity box, according to the table specified temperature and humidity, do not pass the current test.</p> <table><tr><td>Temperature</td><td><math>65 \pm 2^{\circ}\text{C}</math></td></tr><tr><td>Humidity</td><td><math>90\% \pm 10\% \text{RH}</math></td></tr><tr><td>Time</td><td><math>500 \pm 24</math> hours</td></tr></table> <p>Recovery: 2 hours of recovery in standard condition and subsequent testing within 48 hours.</p>	Temperature	$65 \pm 2^{\circ}\text{C}$	Humidity	$90\% \pm 10\% \text{RH}$	Time	$500 \pm 24$ hours												
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Time	$500 \pm 24$ hours																				
11	Low temperature life (IEC68-2-1Ad)	Change in inductance: within $\pm 10\%$ DC resistance change: $\pm 10\%$ within the appearance of no obvious abnormalities, should not have mechanical damage.	<p>The test sample shall be soldered to the test substrate by reflow soldering. The test sample should then be placed in the test conditions as shown in the table below.</p> <table><tr><td>Temperature</td><td><math>-40 \pm 3^{\circ}\text{C}</math></td></tr><tr><td>Time</td><td><math>500 \pm 24</math> hours</td></tr></table> <p>Recovery: 2 hours of recovery in standard condition and subsequent testing within 48 hours.</p>	Temperature	$-40 \pm 3^{\circ}\text{C}$	Time	$500 \pm 24$ hours														
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12	Low temperature load life (IEC68-2-1Ad)	Change in inductance: within $\pm 10\%$ DC resistance change: $\pm 10\%$ within the appearance of no obvious abnormalities, should not have mechanical damage.	<p>The test sample shall be soldered to the test substrate by reflow soldering. The</p> <table><tr><td>Temperature</td><td><math>-55 \pm 2^{\circ}\text{C}</math></td></tr><tr><td>Plus load current</td><td>Rated current</td></tr><tr><td>Time</td><td><math>500 \pm 24</math> hours</td></tr><tr><td>Hourly power time</td><td>3/4 power 1/4 power off</td></tr></table> <p>Recovery: 2 hours of recovery in standard condition and subsequent testing within 48 hours.</p>	Temperature	$-55 \pm 2^{\circ}\text{C}$	Plus load current	Rated current	Time	$500 \pm 24$ hours	Hourly power time	3/4 power 1/4 power off										
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Plus load current	Rated current																				
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13	Damp heat load (MIL-STD-202G Method 108A)	Change in inductance: within $\pm 10\%$ DC resistance change: $\pm 10\%$ within the appearance of no obvious abnormalities, should not have mechanical damage.	<p>The test sample shall be soldered to the test substrate by reflow soldering. Test samples shall be placed in a constant temperature and humidity box, according to the table specified in the temperature and humidity under the continuous access to the rated current for testing.</p> <table><tr><td>Temperature</td><td><math>60 \pm 2^{\circ}\text{C}</math></td></tr><tr><td>Humidity</td><td><math>90 \sim 95\% \text{RH}</math></td></tr><tr><td>Time</td><td><math>500 \pm 24</math> hours</td></tr></table> <p>Recovery: 2 hours of recovery in standard condition and subsequent testing within 48 hours.</p>	Temperature	$60 \pm 2^{\circ}\text{C}$	Humidity	$90 \sim 95\% \text{RH}$	Time	$500 \pm 24$ hours												
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14	High temperature life test (IEC68-2-2Ba)	<p>Change in inductance: within <math>\pm 10\%</math></p> <p>DC resistance change: <math>\pm 10\%</math> within the appearance of no obvious abnormalities, should not have mechanical damage.</p>	<p>The test sample shall be soldered to the test substrate by reflow soldering.</p> <p>The test sample shall be placed in a constant temperature and humidity tank and the current shall not be supplied at the temperature specified in the table.</p> <table><tr><td>Temperature</td><td><math>125 \pm 3^{\circ}\text{C}</math></td></tr><tr><td>Time</td><td><math>500 \pm 24</math> hours</td></tr></table> <p>Recovery: 2 hours of recovery in standard condition and subsequent testing within 48 hours.</p>	Temperature	$125 \pm 3^{\circ}\text{C}$	Time	$500 \pm 24$ hours				
Temperature	$125 \pm 3^{\circ}\text{C}$										
Time	$500 \pm 24$ hours										
15	High temperature load life test (MIL-STD-202G Method 108A)	<p>Change in inductance: within <math>\pm 10\%</math></p> <p>DC resistance change: <math>\pm 10\%</math> within the appearance of no obvious abnormalities, should not have mechanical damage.</p>	<p>The test sample shall be soldered to the test substrate by reflow soldering. The</p> <table><tr><td>Temperature</td><td><math>85 \pm 2^{\circ}\text{C}</math></td></tr><tr><td>Plus load current</td><td>Rated current</td></tr><tr><td>Time</td><td><math>2000 \pm 24</math> hours</td></tr><tr><td>Hourly power time</td><td>3/4 power 1/4 power off</td></tr></table> <p>Recovery: 2 hours of recovery in standard condition and subsequent testing within 48 hours.</p>	Temperature	$85 \pm 2^{\circ}\text{C}$	Plus load current	Rated current	Time	$2000 \pm 24$ hours	Hourly power time	3/4 power 1/4 power off
Temperature	$85 \pm 2^{\circ}\text{C}$										
Plus load current	Rated current										
Time	$2000 \pm 24$ hours										
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