

# Specification for Approval

Date: [2024/1/1](#)

Customer: \_\_\_\_\_

BYTEK P/N: [BCM1006F-SERIES](#)

CUSTOMER P/N: \_\_\_\_\_

DESCRIPTION: \_\_\_\_\_

QUANTITY: \_\_\_\_\_ pcs

REMARK:		
Customer Approval Feedback		

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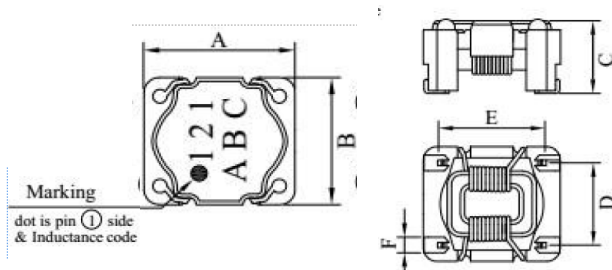
# Wire Wound Power Common Mode Filter

BCM1006F-SERIES

## 1. Features

- Operating temperature -40~+125℃ (Including self - temperature rise)

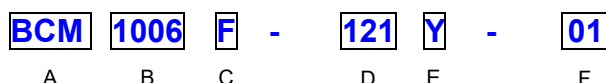
## 2. Dimension



Series	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)
BCM1006	10±0.5	8.7±0.3	6.5 max.	6.22±0.1	7.62±0.1	1.4 REF

Unit:mm

## 3. Part Numbering



A: Series

B: Dimension BxC

C: Type

D: Inductance 121=120uH

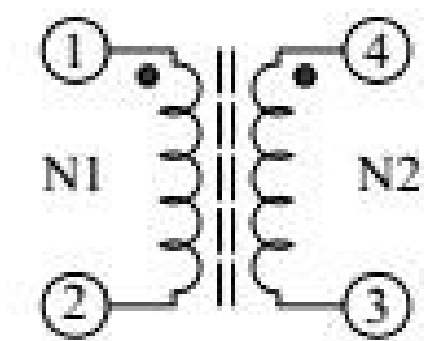
E: Inductance Tolerance M=±40%,Y=±40%

F: Materials

## 4. Specification

Part Number	Impedance(uH)	DC Resistance (mΩ) max.	Rated Current (A) max.	Hi-Pot (Vac) 3mA/1S	Impedance (Ω) Min	Freq. range (MHz)
	@100KHz/0.1V					
BCM1006F-100Y-01	10±40%	30	4.0	600	100	10~300
BCM1006F-220Y-01	22 ±40%	35	3.8	600	300	10~200
BCM1006F-470Y-01	47±40%	40	3.2	600	800	10~100
BCM1006F-101Y-01	100±40%	25	3.0	1000	100	10~300
BCM1006F-121Y-01	120±40%	25	2.5	1000	200	10~200
BCM1006F-221Y-01	220±40%	32	2.2	1000	350	7~150
BCM1006F-251Y-01	250±40%	35	2.0	1000	400	5~100
BCM1006F-471Y-01	470±40%	65	1.6	1000	900	2~40
BCM1006F-501Y-01	500±40%	70	1.5	1000	800	2~50
BCM1006F-102Y-01	1000±40%	180	0.95	1000	1400	1~40
BCM1006F-202Y-01	2000±40%	270	0.80	300	2000	0.5~15
BCM1006F-222Y-01	2200±40%	300	0.75	300	3400	1~11
BCM1006F-302Y-01	3000±40%	330	0.70	300	3000	0.5~10
BCM1006F-332Y-01	3300±40%	360	0.65	300	4400	0.9~7
BCM1006F-392Y-01	3900±40%	540	0.52	300	5000	0.7~6
BCM1006F-402Y-01	4000±40%	600	0.45	300	4000	0.5~5
BCM1006F-472Y-01	4700±40%	720	0.35	300	6200	0.6~3
BCM1006F-502Y-01	5000±40%	780	0.30	300	5000	0.5~3

5. Schematic Diagram



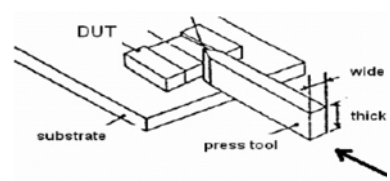
6. Materia

NO.	ITEM	DESCRIPTION
1	CORE	FERRITE
2	CASE	DAP-WH9100
3	WIRE	P180 Grd1
4	SOLDER	Sn99.3:Cu0.7
5	ADHESIVE	XNR-3614
6	INK	WHITE

7. Reliabil y and Test Condition

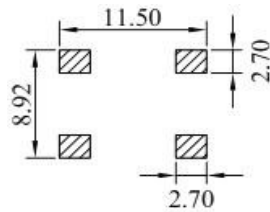
Item	Performance	Test Condition
Operating temperature	-40~+125℃ (Including self - temperature rise)	
Storage temperature	-40~+125℃ (on board)	
Electrical Performance Test		
Z(common mode)	Refer to standard electrical characteristics list.	Agilent-4291A+ Agilent -16197A
DCR		Agilent-4338B
I.R.		Agilent4339
Temperature Rise Test	Rated Current ≥ 1A ΔT 40℃ Max	1.Applied the allowed DC current. 2.Temperature measured by digital surface thermometer

Reliability Test		
Life Test	<p>Appearance : No damage.                      Impedance : within±15% of initial value                      RDC : within ±15% of initial value and shall not exceed the specification value</p>	<p>Preconditioning: Run through IR reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles)                      Temperature : 125±2℃                      Applied current : rated current                      Duration : 1000±12hrs                      Measured at room temperature after placing for 24±2 hrs</p>
Load Humidity		<p>Preconditioning: Run through IR reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles)                      Humidity : 85±2% R.H,                      Temperature : 85℃±2℃                      Duration : 1000hrs Min. Bead : with 100% rated current ,                      Inductance: with 10% rated current                      Measured at room temperature after placing for 24±2 hrs</p>
Moisture Resistance		<p>Preconditioning: Run through IR reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles                      1. Baked at50℃ for 25hrs, measured at room temperature after placing for 4 hrs.                      2. Raise temperature to 65±2℃ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25℃ in 2.5hrs.                      3. Raise temperature to 65±2℃ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25℃ in 2.5hrs,keep at 25℃ for 2 hrs then keep at -10℃ for 3 hrs                      4. Keep at 25℃ 80-100%RH for 15min and vibrate at the frequency of 10 to 55 Hz to 10 Hz, measure at room temperature after placing for 1~2 hrs.</p>
Thermal shock		<p>Preconditioning: Run through IR reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles                      Condition for 1 cycle                      Step1 : -40±2℃ 30±5min                      Step2 : 25±2℃ ≤0.5min                      Step3 : 125±2℃ 30±5min                      Number of cycles : 500                      Measured at room temperature after placing for 24±2 hrs</p>
Vibration		<p>Oscillation Frequency: 10Hz~2KHz~10Hz for 20 minute                      Equipment : Vibration checker                      Total Amplitude:10g                      Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations) *</p>

Item	Performance	Test Condition														
Bending	Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Shall be mounted on a FR4 substrate of the following dimensions: >=0805 inch(2012mm):40x100x1.2mm <0805 inch(2012mm):40x100x0.8mm Bending depth: >=0805 inch(2012mm):1.2mm <0805 inch(2012mm):0.8mm duration of 10 sec.														
Shock		<table><tr><th>Type</th><th>Peak value (g's)</th><th>Normal duration (D) (ms)</th><th>Wave form</th><th>Velocity change (Vi)ft/sec</th></tr><tr><td>SMD</td><td>50</td><td>11</td><td>Half-sine</td><td>11.3</td></tr><tr><td>Lead</td><td>50</td><td>11</td><td>Half-sine</td><td>11.3</td></tr></table>	Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec	SMD	50	11	Half-sine	11.3	Lead	50	11	Half-sine
Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec												
SMD	50	11	Half-sine	11.3												
Lead	50	11	Half-sine	11.3												
Solder ability	More than 95% of the terminal electrode should be covered with solder.	a. Method B, 4 hrs @155°C dry heat @235°C±5°C Testing Time :5 +0/-0.5 seconds b. Method D category 3. (8hours ± 15 min)@ 260°C±5°C Testing Time :30 +0/-0.5 seconds														
Resistance to Soldering Heat		Depth: completely cover the termination <table><tr><th>Temperature(°C)</th><th>Time(s)</th><th>Temperature ramp/immersion and emersion rate</th><th>Number of heat cycles</th></tr><tr><td>260 ±5 (solder temp)</td><td>10 ±1</td><td>25mm/s ±6 mm/s</td><td>1</td></tr></table>	Temperature(°C)	Time(s)	Temperature ramp/immersion and emersion rate	Number of heat cycles	260 ±5 (solder temp)	10 ±1	25mm/s ±6 mm/s	1						
Temperature(°C)	Time(s)	Temperature ramp/immersion and emersion rate	Number of heat cycles													
260 ±5 (solder temp)	10 ±1	25mm/s ±6 mm/s	1													
Terminal Strength	Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value e	Preconditioning: Run through IR reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles With the component mounted on a PCB with the device to be tested, apply a force(>0805:1kg , <=0805:0.5kg)to the side of a device being tested. This force shall be applied for 60 +1 seconds. Also the force shall be applied gradually as not to apply a shock to the component being tested. 														

## 8. Soldering and Mounting

### 8-1. Recommended PC Board Pattern



### 8-2. Soldering

Mildly activated rosin fluxes are preferred. BYTEK terminations are suitable for re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

#### 8-2.1 Soldering Reflow:

Recommended temperature profiles for lead free re-flow soldering in Figure 1. Table 1.1&1.2 (J-STD-020E)

#### 8-2.2 Soldering Iron:

Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended. (Figure 2.)

- Preheat circuit and products to 150°C
- Never contact the ceramic with the iron tip
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- 350°C tip temperature (max)
- 1.0mm tip diameter (max)
- Limit soldering time to 4~5sec.

Fig.1 Soldering Reflow

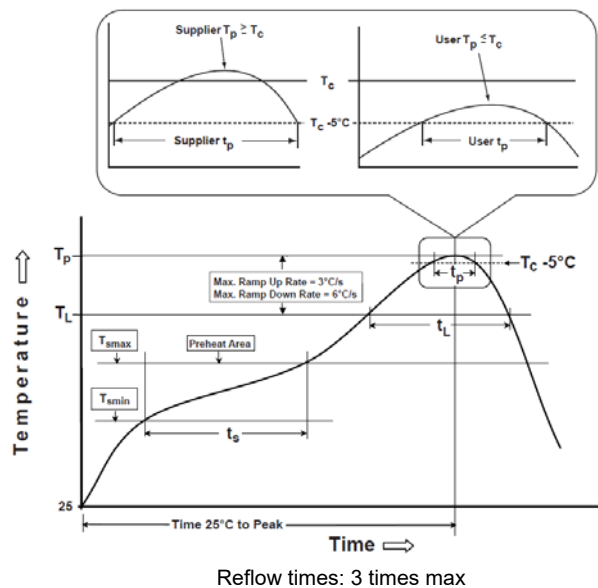


Fig.2 Iron Reflow

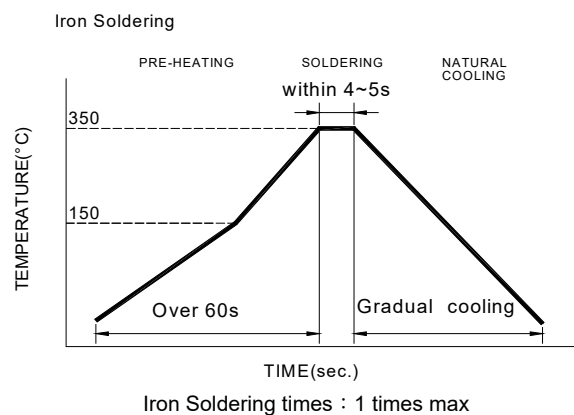


Table (1.1): Reflow Profiles

Profile Type:	Pb-Free Assembly
Preheat -Temperature Min( $T_{smin}$ ) -Temperature Max( $T_{smax}$ ) -Time( $t_s$ )from( $T_{smin}$ to $T_{smax}$ )	150°C 200°C 60-120seconds
Ramp-up rate( $T_L$ to $T_p$ )	3°C /second max.
Liquidus temperature( $T_L$ ) Time( $t_L$ )maintained above $T_L$	217°C 60-150 seconds
Classification temperature( $T_c$ )	See Table (1.2)
Time( $t_p$ ) at $T_c - 5^\circ\text{C}$ ( $T_p$ should be equal to or less than $T_c$ .)	< 30 seconds
Ramp-down rate( $T_p$ to $T_L$ )	6°C /second max.
Time 25°C to peak temperature	8 minutes max.

**T<sub>p</sub>**: maximum peak package body temperature, **T<sub>c</sub>**: the classification temperature.

For user (customer) **T<sub>p</sub>** should be equal to or less than **T<sub>c</sub>**.

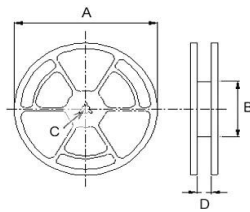
Table (1.2) Package Thickness/Volume and Classification Temperature ( $T_c$ )

	Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
PB-Free Assembly	<1.6mm	260°C	260°C	260°C
	1.6-2.5mm	260°C	250°C	245°C
	≥2.5mm	250°C	245°C	245°C

Reflow is referred to standard IPC/JEDEC J-STD-020E .

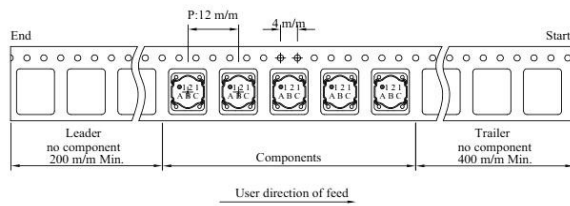
## 9. Packaging Information

### 9-1. Reel Dimension



Reel Dimensions (Unit: mm)			
A	B	C	D
330	100	13	24.5

### 9-2. Tape Dimension

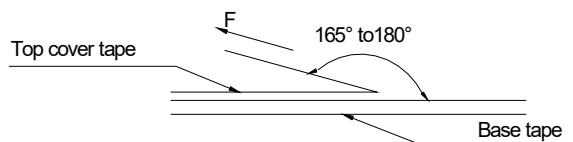


Tape width	Distance	Pull-of force
24 mm	12 mm	10~130g

### 9-3. Packaging Quantity

Size	Reel
BCM1006	800

### 9-4. Tearing Off Force



The force for tearing off cover tape is 15 to 80 grams in the arrow direction under the following conditions.

Room Temp. (°C)	Room Humidity (%)	Room atm (hPa)	Tearing Speed mm/min
5~35	45~85	860~1060	300

#### Application Notice

- Storage Conditions(component level)  
To maintain the solderability of terminal electrodes:
  1. BYTEK products meet IPC/JEDEC J-STD-020E standard-MSL, level 1.
  2. Temperature and humidity conditions: Less than 40°C and 60% RH.
  3. Recommended products should be used within 12 months form the time of delivery.
  4. The packaging material should be kept where no chlorine or sulfur exists in the air.
- Transportation
  - 1.Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
  - 2.The use of tweezers or vacuum pick up is strongly recommended for individual components.
  - 3.Bulk handling should ensure that abrasion and mechanical shock are minimized.