

# PRODUCT SPECIFICATION

SPEC. NO: T-0638-002M

DATE: Aug. 15, 2018

CUSTOMER'S PRODUCT NAME:

EMTEK PRODUCT NAME:

LCD0603-470K-T

THIS SPECIFICATION IS:

- FULLY ACCEPTED  
 DENIED  
 ACCEPTED UNDER THE FOLLOWING CONDITIONS



SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_

NAME(PRINT): \_\_\_\_\_

TITLE: \_\_\_\_\_

 **EMTEK CO., LTD.**

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FACTORY:

39, Chingao Rd., (305)Hsinpu,  
Hsinchu Hsien, Taiwan, R. O. C  
TEL: 03-5894-433  
FAX: 03-5894-523

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## 1. Scope

This specification applies Wire Wound Power Inductors LCD0603-Series to be delivered to user.

## 2. Product Identification

LCD 0603 -470 □ - T

(1) (2) (3) (4) (5)

(1) Product name

(2) Shapes and dimensions

(3) Inductance

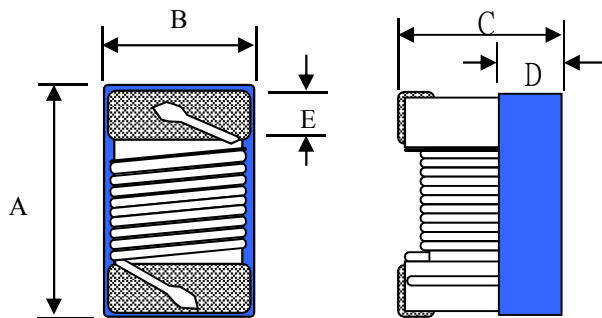
470: 47 uH

(4) Tolerance

K=±10% , M=±20%

(5) Taping Type

## 3. Shapes and Dimensions



A max. : 1.80 mm

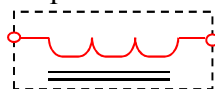
B max. : 1.20 mm

C max. : 1.00 mm

D ref. : 0.45 mm

E : 0.33 mm

Equivalent circuit



No Polarity

Drawn by	Checked by	Approved by
Cindy Jan. 18. 2018	Zheng Jan. 18. 2018	Su Jan. 18. 2018

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## 4. Electrical Characteristics

Customer Part Number	Our Product Part Number	Inductance (uH)/MHz	Inductance Tolerance	Q/MHz Typ.	SRF Typ. (MHz)	Rdc ±30% (Ω)	Idc Typ. (mA)	Irms Typ. (mA)	Color Coding
	LCD0603-470□-T	47/2.5	K	12/2.5	11	11.20	100	110	Gray
			M						

1. When ordering, please specify tolerance and packaging codes. Ex: LCD0603-470K-T

Tolerance : K = ±10% , M = ±20%

Packaging : Clear tape and reel {standard}.

2. L , Q 、 SRF : Agilent/HP E4991A+ Agilent/HP 16197A

(The electrical specification test by the smallest gap position) or HP16193A

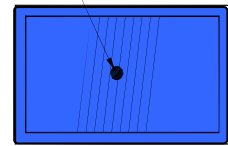
3. Rdc : DIGITAL MILLIOHM METER Chroma 16502, or equivalent.

4. Idc for Inductance drop 10% from its value without current.

5. Irms for a 15°C rise above 25°C ambient.

6. Operating temperature range from -40°C to 105°C.

1st



**COLOR CODING**

## 5. Material list

Item	Material
Core	Ferrite core
Wire	Copper wire
Epoxy	UV Epoxy

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## 6. Reliability Test

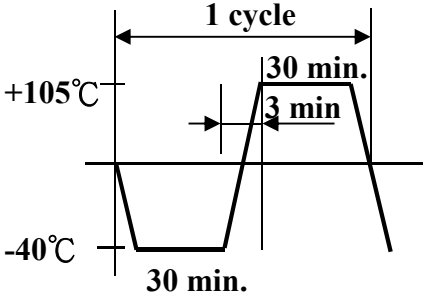
Item	Specifications	Test conditions
Solderability	The metalized area must have 90% minimum solder coverage.	Dip pads in flux and dip in solder pot( 96.5 Sn/3.5 Ag solder) at 255°C ±5°C.
Resistance to soldering heat	There must be no case deformation or change in dimensions. Inductance must not change more than the stated tolerance.	Inductors shall be reflowed onto a PC board using 96.5 Sn/3.5 Ag solder paste. Solder process shall be at a maximum temperature of 260°C. For 96.5 Sn/3.5 Ag solder paste:>217°C for 90 seconds
Vibration	There must be no case deformation or change in dimensions. Inductance must not change more than the stated tolerance.	Solder specimen inductor on the test printed circuit board. Apply vibrations in each of the x,y and z directions for 2 hours for a total of 6 hours. Frequency : 10~50 Hz Amplitude : 1.5mm
High temperature resistance	There must be no case deformation or change in dimensions. Inductance must not change more than the stated tolerance.	Inductors shall be subjected to temperature 105±2°C for 50±12 hours. Measure the test items after leaving the inductors at room temperature and humidity for 2 hours.
Static Humidity	Inductors must not have a shorted or openwinding.	Inductors shall be subjected to temperature 85±2°C and 90 to 95%RH. for ten 24-hours. Measure the test items after leaving the inductors at room temperature and humidity for 2 hours.
Component adhesion (push test)	Inductors shall be subjected to 0.45Kg	Inductors shall be reflow soldered (255°C ±5°C for 10 seconds) to a tinned copper substrate. A force gauge shall be applied to the side of the component. The device must withstand the stated force without a failure of the termination.

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Item	Specifications	Test conditions
Low temperature resistance	There must be no case deformation or change in dimensions. Inductance must not change more than the stated tolerance.	Inductors shall be subjected to temperature $-40\pm 2^{\circ}\text{C}$ for $48\pm 12$ hours. Measure the test items after leaving the inductors at room temperature and humidity for 1 to 2 hours.
Resistance to solvent	There must be no case deformation, change in dimensions, or obliteration of marking.	Inductors must withstand 6 minutes of alcohol or water.
Thermal cycle	There must be no case deformation or change in dimensions. Inductance must not change more than the stated tolerance.	Inductors shall be subjected to 5 cycles to the following temperature cycle: <div style="text-align: center;">  <p>The diagram illustrates a single thermal cycle. It starts at a baseline temperature, drops to <math>-40^{\circ}\text{C}</math> and remains there for 30 minutes. It then ramps up to <math>+105^{\circ}\text{C}</math> in 3 minutes, stays at <math>+105^{\circ}\text{C}</math> for 30 minutes, and then ramps down back to the baseline. The total duration of one cycle is indicated as 1 cycle.</p> </div> Measure the test items after leaving the inductors at room temperature and humidity for 2 hours.



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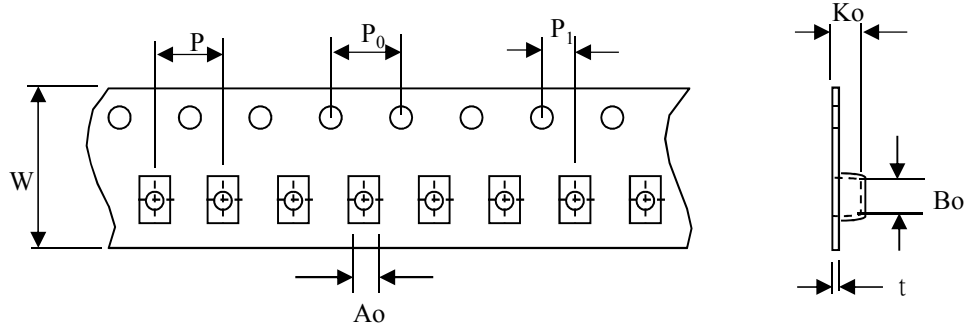
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## 7. Packaging

The packaging must be done not to receive any damage during transporting and storing.

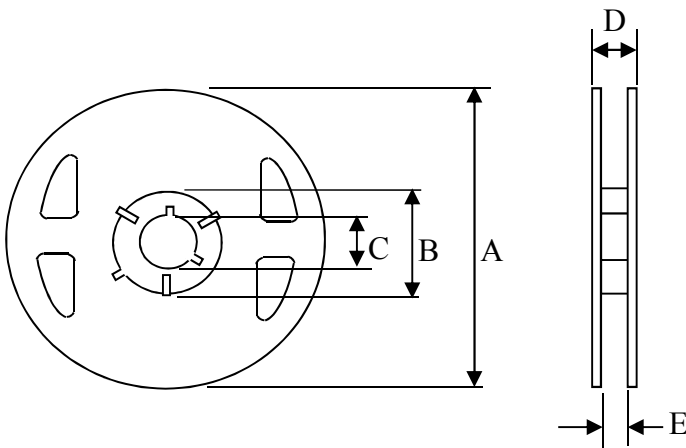
### 7-1 Tape dimensions



(Dimensions in mm; Tolerance : ±0.1)

Symbol	W	P	P <sub>0</sub>	P <sub>1</sub>	Ao	Bo	Ko	t
Dimension	8	4	4	2	1.25	1.9	1.05	0.22

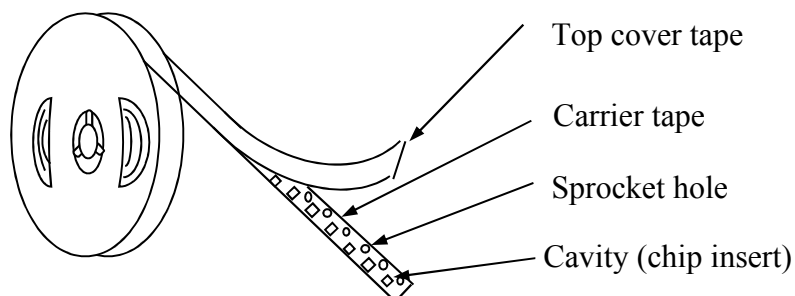
### 7-2 Reel dimensions



(Dimensions in mm)

Symbol	T
A	180
B	60
C	13
D	14.4
E	8.4

### 7-3 Tapping figure



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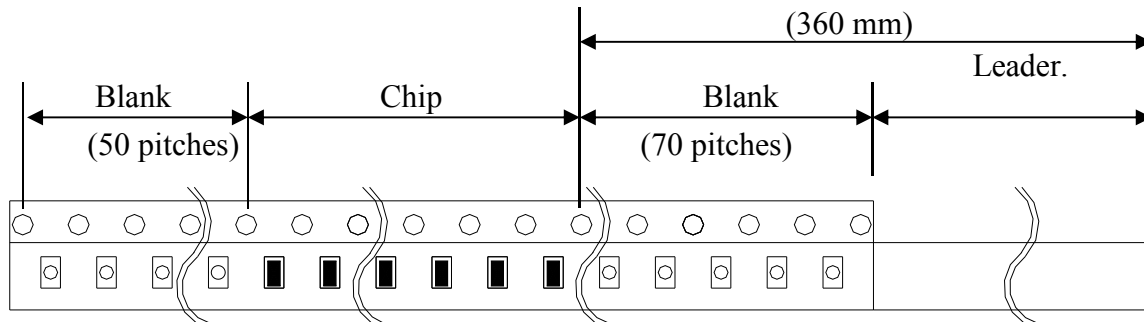
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## 7-4 Packaging Form

There shall not continuation more than two vacancies of the product.



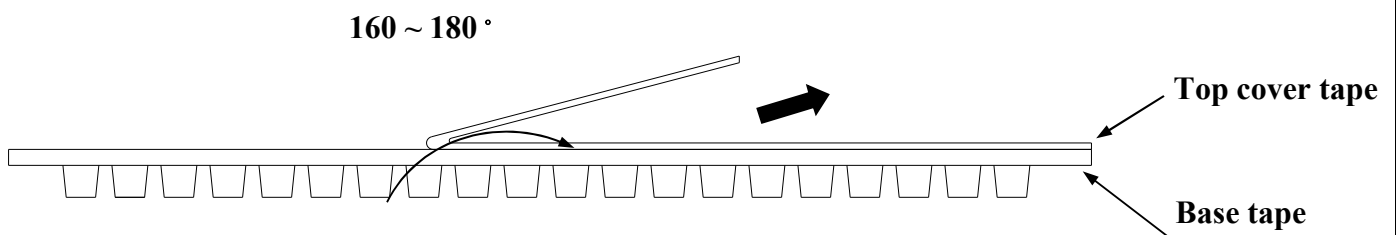
## 7-5 Cover Tape Peel Strength

The force for tearing off cover tape is 0.1~0.6(N) in the arrow direction at the following conditions:

Temperature : 5 ~ 35°C

Humidity : 45 ~ 85%

Atmospheric pressure : 860 ~ 1060 hpa



## 7-6 Packing Quantity

φ180 mm reel type : 4,000 pcs./reel

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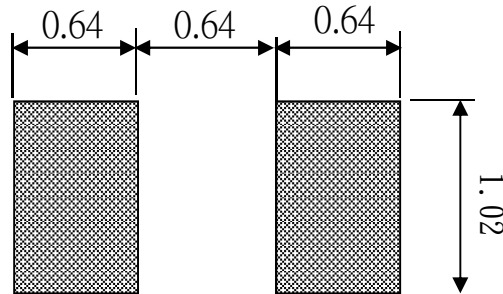
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## 8. Recommended Soldering Conditions (Please use this product by reflow soldering)

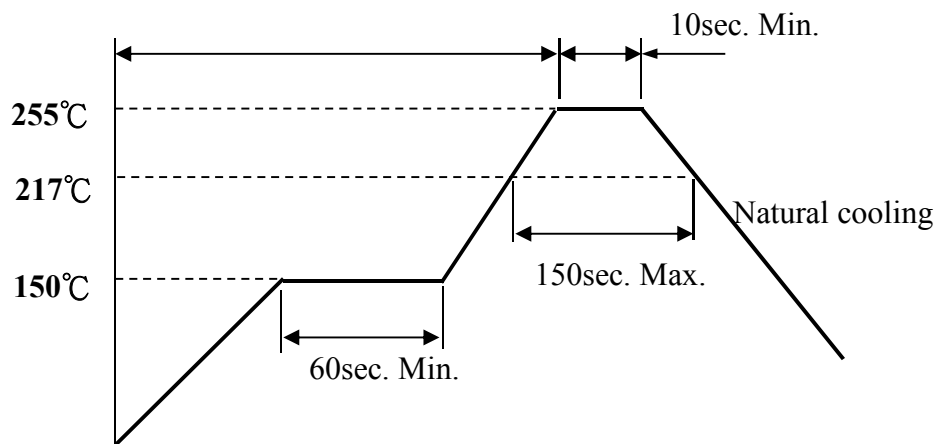
### 8-1 Recommended Footprint



Unit: mm

### 8-2 Recommended Reflow Pattern

Reflow : until two times



### 8-3 Iron Soldering

Use a solder iron of less than 30W when soldering, do not allow the soldering iron tip directly touch the Ceramic body outside of terminal electrode.

5 seconds max. at 260°C.

## 9. Attention in Case of Using

In case of using product, please avoid following matters:

Splashing water or salt water

Dew condenses

Toxic gas (Hydrogen sulfide, Sulfurous acid, Chlorine, Ammonia)

Vibrations or shocks which exceed the specified condition

Please be careful for the stress to this product by board flexure or something after the mounting.

## 10. Others

10-1 Operating temperature range : Ferrite Series : -40~+105°C

10-2 Storage condition : Temperature 20°~25°C, Relative Humidity 40%~60%

10-3 Recommended wire wound inductors should be used within 6 months from the time of delivery.



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