

Features

1. Effective for suppressing common mode noise at high frequency from several MHz to several hundreds MHz.
2. Compact design.
3. Excellent solderability characteristics.

Applications

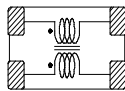
1. Noise suppression in digital bus line equipment.
2. IEEE1394a HUB & IEEE1394a control lines.
3. USB host controller & USB, HUB control lines.

Ordering Information

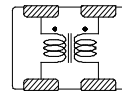
WPCMV - 2 M 3216 - 471 T
 (1) (2) (3) (4) (5) (6)

(1) Series

WPCMV: Common mode filter for Vertical
 WPCML: Common mode filter for Horizontal



WPCML: Horizontal design



WPCMV: Vertical design

(2) Pole Type

- 2: 2 pole (single)
- 4: 4 pole (double)

(3) Material & Design

M: Standard Thickness
 L: Low profile

(5) Common mode impedance (at 100MHz)

The first two digits are significant.
 The last digit is the number of zeros following.

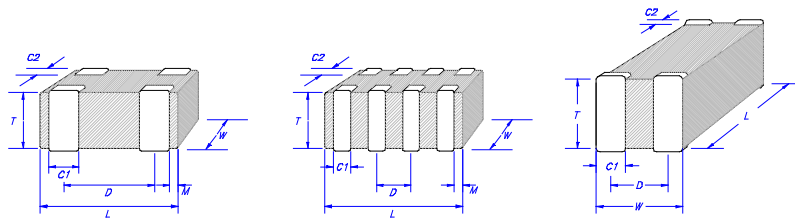
(4) Dimensions

The first two digits: length(mm)
 The last two digits: width(mm)

(6) Packing

B: Bulk Packing
 T: Tape & Reel (_ 178mm [7 inches])
 L: Tape & Reel (_ 254mm [10 inches])

Shape and Dimensions



WPCMV-2S Series

WPCMV-4S Series

WPCML-2S Series

Units: mm [inches]

Type	L	W	T		C ₁	C ₂	D	M
			M	L				
WPCMV-2M2012	2.0±0.2 [.079±.008]	1.25±0.2 [.049±.008]	1.0±0.1 [.039±.004]	0.8±0.1 [.031±.004]	0.6±0.2 [.024±.008]	0.25±0.15 [.010±.006]	1.0±0.1 [.039±.004]	0.20±0.1 [.008±.004]
WPCML-2M2012	2.0±0.2 [.079±.008]	1.25±0.2 [.049±.008]	1.0±0.1 [.039±.004]	0.8±0.1 [.031±.004]	0.425±0.2 [.017±.008]	0.25±0.15 [.010±.006]	0.825±0.1 [.032±.004]	---- ----
WPCMV-2M3216	3.2±0.2 [.126±.008]	1.6±0.2 [.063±.008]	1.3±0.1 [.051±.004]	1.0±0.1 [.039±.004]	0.7±0.2 [.028±.008]	0.3±0.2 [.012±.008]	2.1±0.2 [.083±.008]	0.20±0.1 [.008±.004]
WPCMV-4M2012	2.0±0.2 [.079±.008]	1.25±0.2 [.049±.008]	1.0±0.1 [.039±.004]	0.8±0.1 [.031±.004]	0.25±0.1 [.010±.004]	0.25±0.15 [.010±.006]	0.50±0.1 [.020±.004]	0.125±0.1 [.005±.004]
WPCMV-4M3216	3.2±0.2 [.126±.008]	1.6±0.2 [.063±.008]	1.3±0.1 [.051±.004]	1.0±0.1 [.039±.004]	0.4±0.2 [.016±.008]	0.3±0.2 [.012±.008]	0.80±0.1 [.031±.004]	0.20±0.1 [.008±.004]

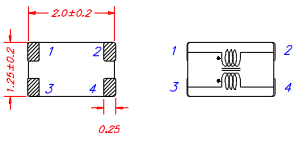
Specifications
WPCMV series (For Vertical)

Part No.	Impedance (Ω) at 100MHz Typ.	DC Resistance Max. (Ω)	Rated current Max. (mA)	Rated Voltage Max. (V)	Insulation Resistance Min. (M Ω)
WPCMV-2□2012-700T	70	0.60	400	10	100
WPCMV-2□2012-900T	90	0.70	400	10	100
WPCMV-2□2012-121T	120	0.80	400	10	100
WPCMV-2□2012-181T	180	1.00	330	10	100
WPCMV-2□2012-221T	220	1.00	330	10	100
WPCMV-4□2012-700T	70	0.80	400	5	100
WPCMV-4□2012-900T	90	0.80	400	5	100
WPCMV-4□2012-121T	120	0.90	400	5	100
WPCMV-4□2012-181T	180	1.00	330	5	100
WPCMV-4□2012-201T	200	1.00	330	5	100
WPCMV-4□2012-221T	220	1.00	330	5	100
WPCMV-2□3216-700T	70	0.50	400	16	100
WPCMV-2□3216-900T	90	0.55	400	16	100
WPCMV-2□3216-121T	120	0.60	400	16	100
WPCMV-2□3216-181T	180	0.65	330	16	100
WPCMV-2□3216-221T	220	0.70	330	16	100
WPCMV-2□3216-471T	470	0.80	250	16	100
WPCMV-4□3216-700T	70	0.60	400	10	100
WPCMV-4□3216-900T	90	0.70	400	10	100
WPCMV-4□3216-121T	120	0.80	400	10	100
WPCMV-4□3216-181T	180	0.90	330	10	100
WPCMV-4□3216-221T	220	0.90	330	10	100

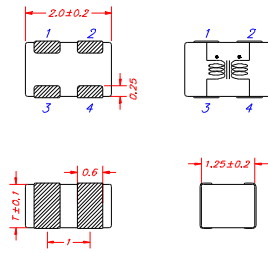
WPCML series (For Horizontal)

Part No.	Impedance (Ω) at 100MHz Typ.	DC Resistance Max. (Ω)	Rated current Max. (mA)	Rated Voltage Max. (V)	Insulation Resistance Min. (M Ω)
WPCML-2□2012-700T	70	0.60	400	10	100
WPCML-2□2012-900T	90	0.70	400	10	100
WPCML-2□2012-121T	120	0.80	400	10	100
WPCML-2□2012-181T	180	1.00	330	10	100
WPCML-2□2012-221T	220	1.00	330	10	100

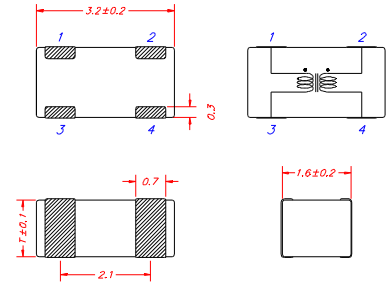
Visual Dimensions



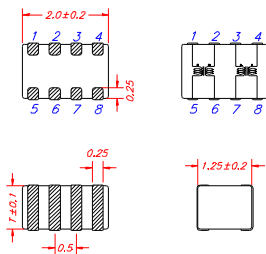
WPCML-2□2012



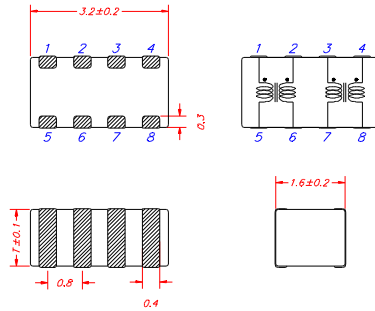
WPCMV-2□2012



WPCMV-2□3216

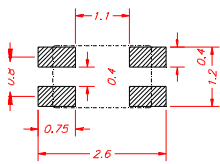


WPCMV-4□2012

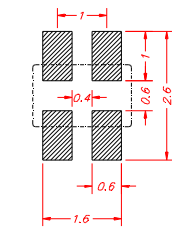


WPCMV-4□3216

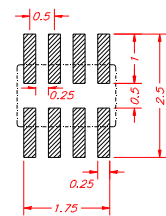
Land Pattern Design



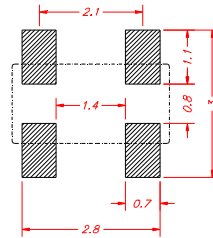
WPCML-2□2012



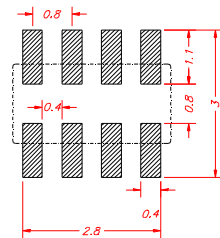
WPCMV-2□2012



WPCMV-4□2012



WPCMV-2□3216

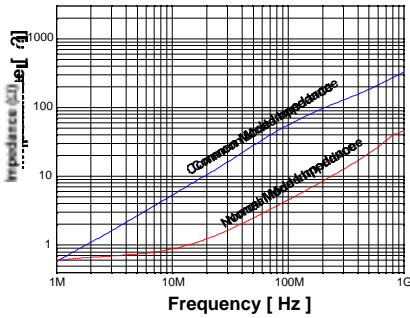


WPCMV-4□3216

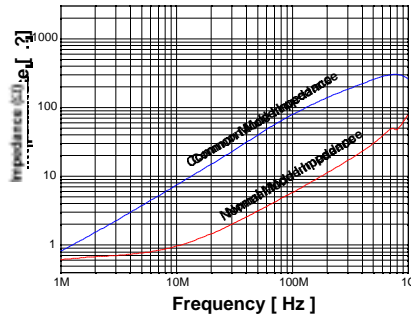
Electrical Characteristics

2012 – 2Line (Single)

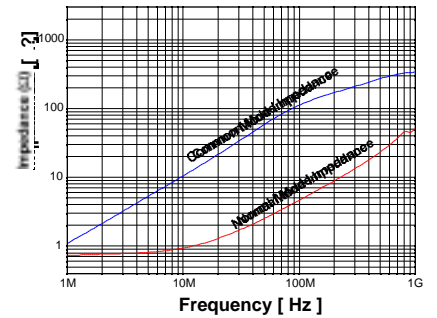
WPCMV-2□2012-700



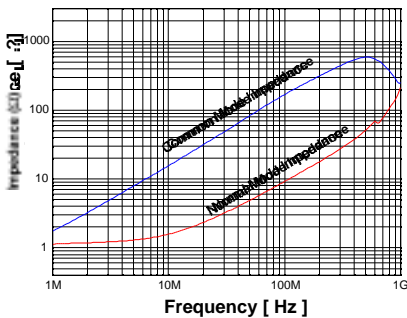
WPCMV-2□2012-900



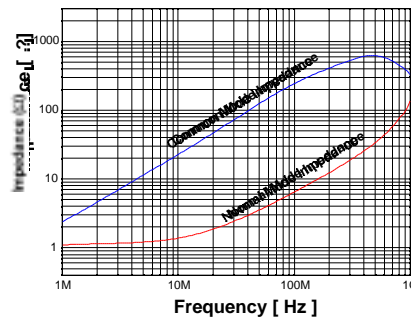
WPCMV-2□2012-121



WPCMV-2□2012-181

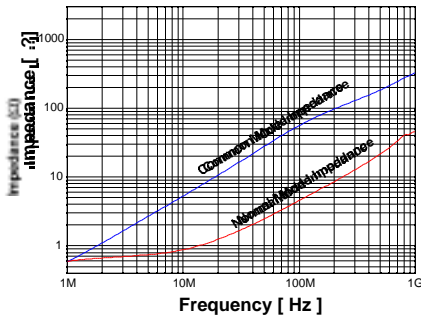


WPCMV-2□2012-221

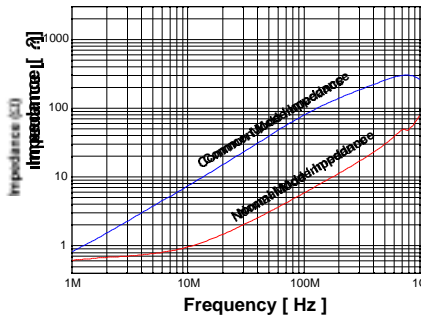


2012 – 4Line (Double)

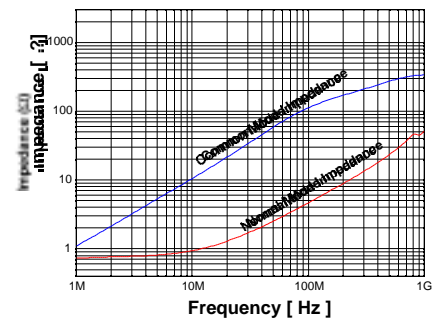
WPCMV-4□2012-700



WPCMV-4□2012-900

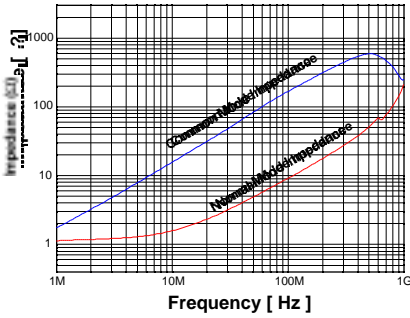


WPCMV-4□2012-121

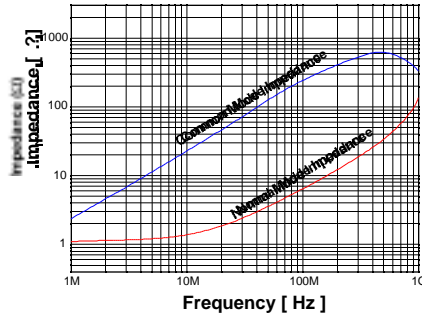


2012 – 4Line (Double) (Cont'd)

WPCMV-4□2012-181

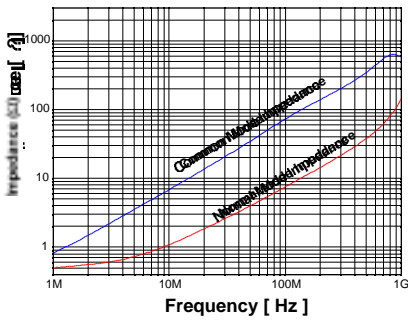


WPCMV-4□2012-221

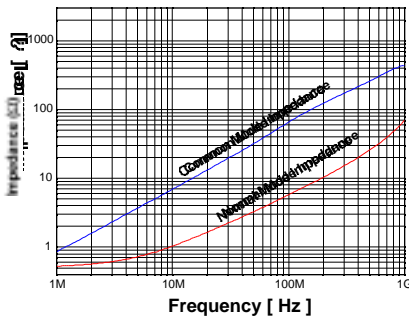


3216 – 2Line (Single)

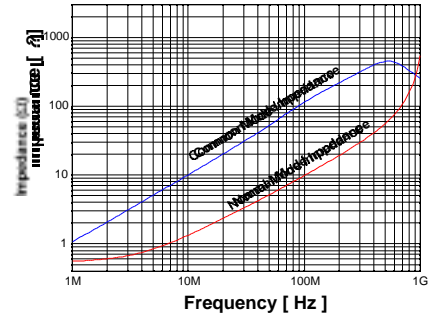
WPCMV-2□3216-700



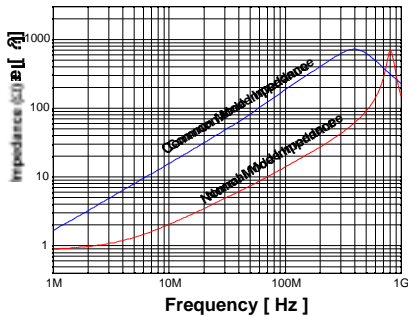
WPCMV-2□3216-900



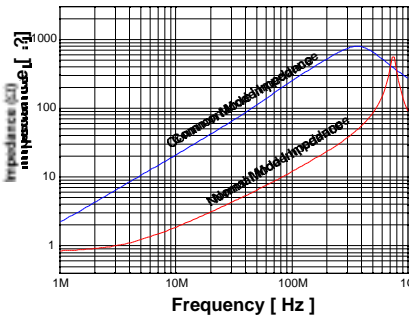
WPCMV-2□3216-121



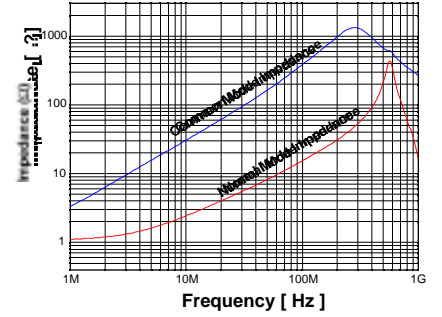
WPCMV-2□3216-181



WPCMV-2□3216-221

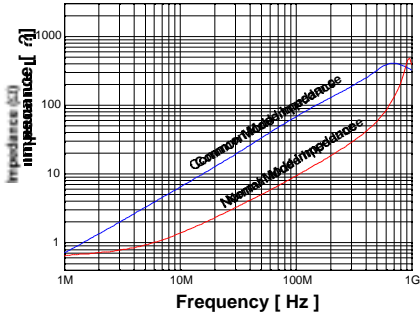


WPCMV-2□3216-471

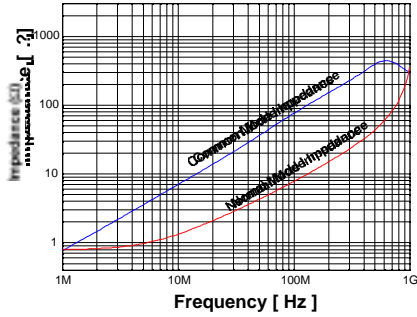


3216 – 4Line (Double)

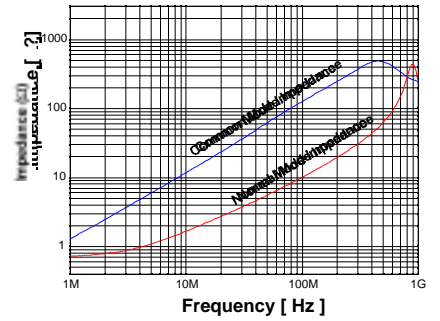
WPCMV-4□3216-700



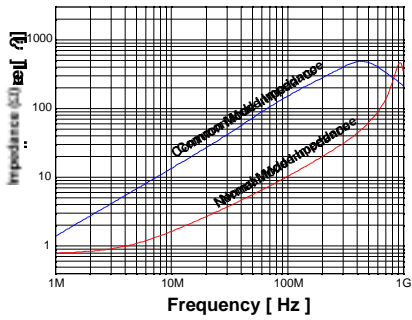
WPCMV-4□3216-900



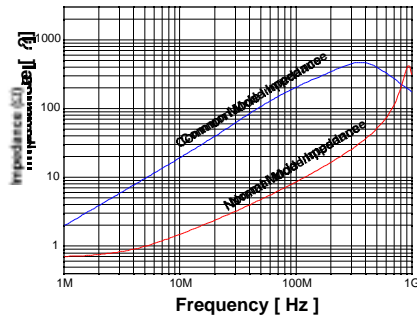
WPCMV-4□3216-121



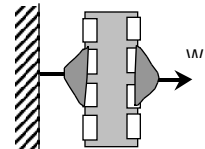
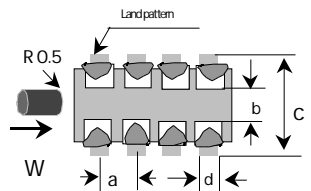
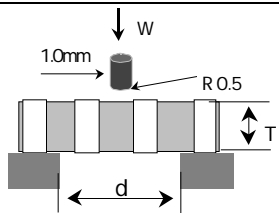
WPCMV-4□3216-181



WPCMV-4□3216-221



Reliability and Test Conditions

ITEM	REQUIREMENTS					TEST CONDITION	
	2012 2Line		2012 4Line	3216 2Line	3216 4Line		
	WPCML	WPCMV					
Operating temp. range	-30°C~+85°C					-	
Storage temp. & humidity range	40°C max. , 70% RH max.					at packing condition	
Resistance to solder heat	1. No damage such as cracks should be caused in chip element. 2. More than 75% of the terminal electrode shall be covered with new solder.					Preheat temperature: 100 to 150°C Preheat time: 1min Solder temperature: 260 ±10°C Dipping time: 10 ±0.5sec.	
Solderability	1. More than 90% of the terminal electrode shall be covered with new solder.					Preheat temperature: 100 to 150°C Preheat time: 1min Solder temperature: 230 ±10°C Dipping time: 3 ±1sec.	
Reflow soldering	1. More than 50% of the terminal electrode shall be covered with new solder. 2. Impedance change : ±within 30%					Preheat temperature: 150°C Preheat time: 1min Solder temperature: 230°C Soldering time: 10 sec. max. (Reflow soldering profile)	
Tensile strength (Terminal strength)	1. No mechanical damage					 Unit : Kgf(W)	
	W	1.2	1.2	1.2	1.2		
Adhesion of Terminal electrode (Flexure strength)	1.No mechanical damage						
	Unit : mm (a,b,c), Kgf(W)						
	a	0.8	1.0	0.5	2.1		0.8
	b	1.1	0.6	0.5	0.8		0.8
	c	2.6	2.6	2.5	3.0		3.0
	d	0.6	0.6	0.25	0.7		0.4
Body strength (Bending strength)	1.The body shall not be damaged by forces applied on the right.						
	Unit : mm (d), Kgf(W)						
	d	1.3	1.3	2.0	2.0		
W	2.0	2.0	3.0	3.0			

Reliability and Test Conditions (Continued)

ITEM	REQUIREMENTS				TEST CONDITION
	2012 2Line	2012 4Line	3216 2Line	3216 4Line	
Drop	1. No mechanical damage				Drop 10 times on a concrete floor from a height of 91cm
Vibration	1. No mechanical damage				Frequency : 10~55~10Hz Amplitude : 1.52mm Direction and time : X,Y,Z directions for 2 hours
Thermal shock (Temperature cycle)	1. No mechanical damage 2. Impedance change: \pm within 30%				Step1. $-40 \pm 3^{\circ}\text{C}$ 30 \pm 3min. Step2. $85 \pm 3^{\circ}\text{C}$ 30 \pm 3min. Number of cycle : 100 times Measured at room ambient temperature after placing for 24 hours
Heat load resistance	1. No mechanical damage 2. Impedance change: \pm within 30%				Temperature : $85 \pm 2^{\circ}\text{C}$ Applied current : rated current Time : 1,000 hours Measured at room ambient temperature after placing for 24 hours
Low temp. resistance	1. No mechanical damage 2. Impedance change: \pm within 30%				Temperature : $-40 \pm 5^{\circ}\text{C}$ Time : 1,000 hours Measured at room ambient temperature after placing for 24 hours
Humidity resistance	1. No mechanical damage 2. Impedance change: \pm within 30%				Temperature : $40 \pm 2^{\circ}\text{C}$ Humidity : 90~95% RH Time : 500 hours Measured at room ambient temperature after placing for 24 hours
Humidity load resistance	1. No mechanical damage 2. Impedance change: \pm within 30%				Temperature : $40 \pm 2^{\circ}\text{C}$ Humidity : 90~95% RH Applied current : rated current Time : 500 hours Measured at room ambient temperature after placing for 24 hours

Packing

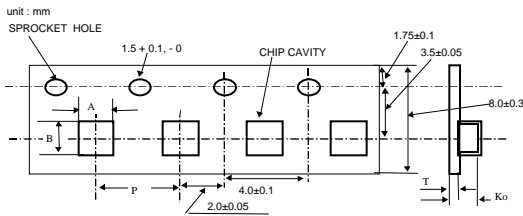
1. Label
 - Part name.
 - Lot No.
 - Quantity.
 - Manufacturer.
2. Standard quantity for packing

Packing Type(EIA)	Tape & Reel			Bulk Vinyl or Cassette
	Reel	Inner box	Carton box	
2012	3,000	30,000	120,000	As wanted
	7,000	70,000	280,000	
3216	3,000	30,000	120,000	
	7,000	70,000	280,000	

* Packing method can be changed, based on user's request.

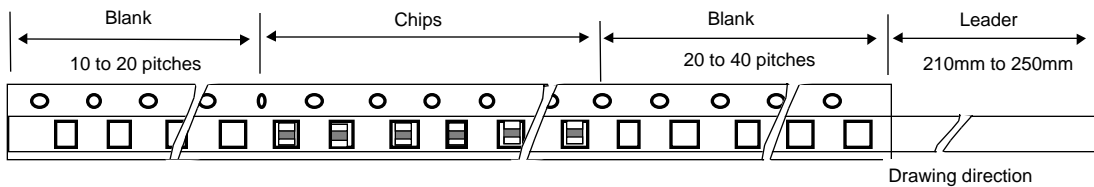
Tape Dimension

Embossing 8m m



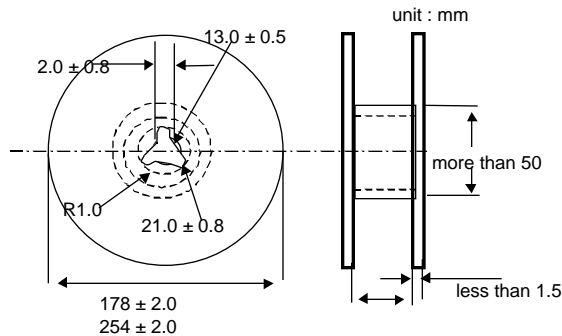
Type	A ± 0.1	B ± 0.1	P ± 0.1	K ₀ ± 0.1	T (max.)
WPCM□ - □M2012	1.45	2.25	4.0	1.35	0.3
WPCM□ - □L2012				1.00	
WPCM□ - □M3216	1.90	3.60	4.0	1.75	0.3
WPCM□ - □L3216				1.35	

Leader and Blank Portion



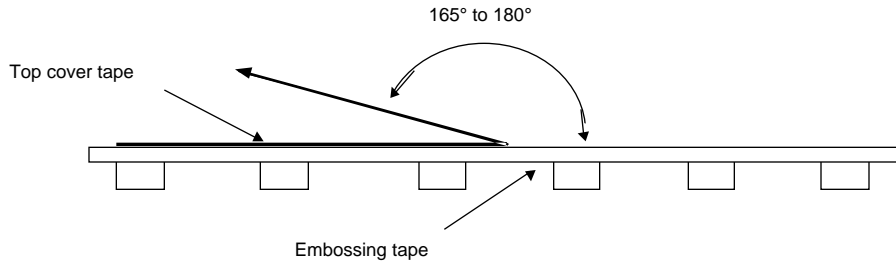
The pitch holes shift within ±0.3mm for cumulative 10 pitches.

Reel Dimension



Type	W (mm)
2012, 3216	9.0 ± 0.3

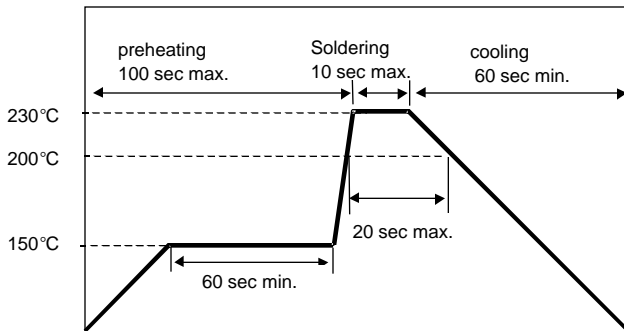
Top Cover Tape Strength



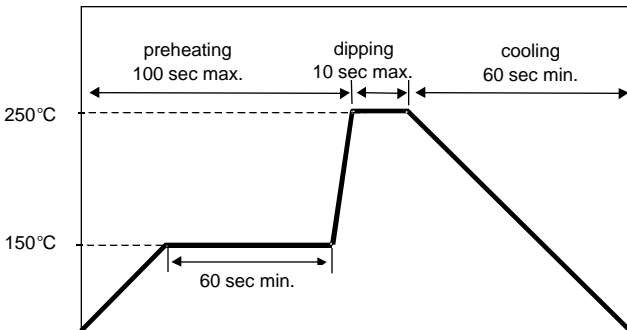
The force for tearing off top cover tape is 20 to 70 grams in the arrow direction.

Soldering Profile

1. Reflow Soldering



2. Flow Soldering



3. MANUAL SOLDERING

