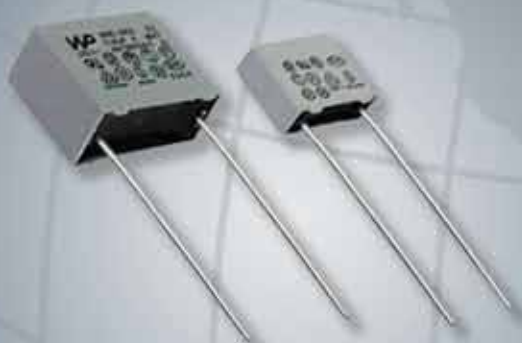




CELEBRATING 40 YEARS IN BUSINESS

# RFI SUPPRESSORS



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World Products' Metallized Polypropylene and Polyester RFI Suppressors are intended for use on line-to-line (X2) and line-to-ground (Y2) AC Mains. Our proprietary construction method allows these devices to withstand the stresses of high voltage transient pulses and remain safe according to international safety standards without degradation of performance. They are constructed of the finest materials available for the purpose of providing maximum reliability and long life. Stringent quality controls are used throughout production.

These suppressors are designed to suppress radio interference, conducted on the AC mains, generated from household appliances, computers, switch mode power supplies, and other electronic equipment. They are available in a wide range of capacitance values and industry standard case sizes.

### Featuring...

- International Safety Approvals
- Excellent Self Healing Properties
- High Dv/Dt Ratings
- Flame Retardant Encapsulation
- 100% Production Lot Testing
- Standard Electrical AQL - 0.065
- RoHS Compliance commenced July 2005

## General Information

RFI suppressors are a special class of capacitors for use on the AC power line inputs to electronic or electrical equipment. Their purpose is to eliminate or attenuate radio frequency interference voltages originated in the units connected to the same AC power branch and prevent them from mutually disturbing their operations.

They must endure very harsh conditions existing on the 60/50Hz AC power lines — including voltage surges and transients. Therefore, they must meet the requirements of EN 60384-14 and IEC 384-14, 2nd edition 1993 standards enforced by international safety certification bodies, as well as UL-1414 and UL-1283 in USA.

Our RFI capacitors are made with metallized polypropylene or polyester films of the highest quality and have self healing properties. There are two classes of these capacitors: Line-to-Line X2 Class, and Line-to-Ground Y2 Class. We have two series of X2 — WXP and WXPC series rated at 300VAC and 275VAC(2.2-6.8µF rated at 300VAC (600VDC)) — and two series of Y2 — WYP and WYE rated at 275VAC and 250 VAC. WXP, WXPC (smaller dimensions) and WYP series are made with polypropylene film. WYE series is made with polyester film.

While polypropylene and polyester series are compatible, polypropylene dielectrics are more popular worldwide and have smaller dissipation factor (DF) improving operation at higher frequencies. Also, due to larger production volumes polypropylene capacitors are less expensive.

Our manufacturing plant has received the Certificate of Quality Assurance System according to the ISO9001 standard.

Please contact World Products, LLC for more information about RFI suppressors.

## RoHS Compliance

<b>WXPC</b>	0.010 to 1.5µF/275VAC class X2	This is to certify that the referenced RFI suppressors purchased from World Products, LLC comply to a maximum concentration value of 0.1% by weight in homogeneous materials for lead (Pb), mercury, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) and of 0.01% weight in homogeneous materials for cadmium and are in compliance with Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS Directive) as of July 2005 (date code marking starting 0527). Additionally “R” marking (per marking specification) is initiated starting with date code 0544 to further identify RoHS compliant products.
<b>WXPC</b>	2.2 to 6.8µF/300VAC class X2	
<b>WXP</b>	0.010 to 2.2µF/300VAC class X2	
<b>WYP</b>	0.010 to 0.1µF/275VAC class Y2	
<b>WYE</b>	0.001 to 0.0068µF/250VAC class Y2	

**Note**

All our capacitors listed above have Climatic Category: IEC 40/100/56 C, and Operating Temperature Range: -40 to +100°C.

## Definition of Terms

**Capacitance**

Capacitance values are measured and specified for 1KHz at 25°C

**Dissipation Factor (DF)**

The measure of the suppressor’s dielectric loss at 1KHz also called tangent of loss angle. It is the ratio of loss power to the reactive power across capacitor that is customarily expressed in % (Ratio =  $\tan\delta = .01 \rightarrow DF = 1\%$ ). At large DF and operation above specified limits loss power may cause significant internal heating leading to destructive breakdown. All of our suppressors are designed and made with top quality materials to minimize DF.

**Insulation Resistance (IR)**

Measurement of the specified IR is made after applying 100 VDC for one minute at 25°C. The proprietary multiple dielectric design of our suppressors provides higher insulation resistance than single dielectric suppressors.

**Climatic Category**

According to international safety standards, IEC 60384-14, and IEC 60068-2, suppressors must be categorized according to the rated lowest temperature / the rated highest temperature / the number of days samples are subjected to damp humidity test — in our case: 56 days — which is the absolute maximum rating category.

**Rated Voltage**

The rated voltage is the maximum RMS AC voltage which can be applied continuously within the specified Rated Temperature range.

**Rated Temperature Range**

The maximum low and high ambient temperature at which the rated voltage can be continuously applied.

**Endurance Life Test**

Production samples are subjected to a periodic life endurance testing to comply with international safety approval standards. These tests specify that the suppressor shall have 1.25 x rated voltage (X2) and 1.7 x rated voltage (Y2) applied for a period of 1,008 hours at an elevated temperature of 100°C. We test our WYE suppressors with the above endurance voltages, not only at the time of type approval, but also at 6 month intervals. In addition to the above voltages applied constantly, 1000 VAC is applied once each hour for 0.1 second. Both the steady state and momentary (0.1 sec) 1000 VAC voltage is applied through a 47 ohm ± 5% resistor simulating the high frequency impedance of AC mains. After the endurance life test, capacitance shall not deviate more than 5% of the initial value, IR shall not be less than 50% of the initial value and DF shall not be greater than the specified. The combined stress of both voltages applied is proof that these suppressors are capable of withstanding high line conditions that are often present on the AC mains.

dv/dt

The maximum acceptable voltage rate of change per µsec of rise or fall time as defined below:

$$dv/dt = \frac{VR}{R \times C}$$

VR = Rated DC Voltage

R = Discharge Resistor

C = Capacitance Tested

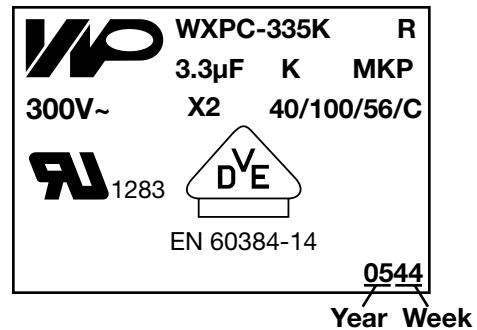
## Mechanical Specifications

<b>Vibration</b>	IEC 68 - 2 - 6, test FC	3 directions at 2 hours each 10-500 Hz at 98 m/s <sup>2</sup>
<b>Bump</b>	IEC 68 - 2 - 29, test Eb	4000 Bumps at 390 m/s <sup>2</sup>
<b>Solderability</b>	IEC 60068-2-20 (Method 2)	
<b>Fire Hazard</b>	UL1414 IEC 695 - 2 - 2	According to Section 18 in this Standard P > = 15mm, 120 seconds P < = 15mm, 60 seconds.
<b>Humidity</b>	IEC 68 - 2 - 3, test Ca	X Class 56 days. Y Class 56 days.
<b>Plastic Case</b>	UL 94V - 0	Flame Retardant, Molded Plastic, Epoxy Resin Sealed.
<b>Operating Temperature</b>	-40°C to +100°C	
<b>Storage Temperature</b>	+5°C to +35°C	RH ≤ 80% (area should be free from bases, acids, salts, mold & fungi).

## Marking and Safety Approvals

### Marking

- World Products, LLC Logo
- Part Number & Film Symbol (MKP or MKT)
- Capacitance
- Rated Voltage
- Climatic Category
- Class (X2 or Y2)
- Safety Approval Marking
- EIA Date Code (YYWW) Year & Week #
- "R" (optional) for RoHS Compliant type



### Safety Approval References

Symbol	Country	Reference	WYE File	WXP File	WXPC File	WYP File
UL	USA	UL 1283	E119899	E119899	E119899	E119899
UL and C-UL	USA	**UL 1414	E71602	E71602	E71602	E71602
CSA	Canada	**22.2 No.1		LR86091		
CSA	Canada	E384-14-95		***LR86091		
VDE	Germany	*	87425	94633	94633	132747

\* Approval test standards: EN 60384-14, 1994/IEC 384-14, 2nd Edition, 1993

\*\* UL1414, C-UL, and CSA 22.2 No. 1 approvals apply only up to 1µF.

\*\*\* For WXP capacitance values 1.5µF and 2.2µF only.

NOTE: Approvals only apply to solid uninsulated leads (standard lead type) with the exception of UL1414/C-UL where approvals additionally extend to stranded cu wire, 0.5mm 2, PCV insulated with 7.0 striped end.

## WXP & WXPC Series

### Part Numbering System

#### Metallized Polypropylene Film Capacitors

Example:

**WXP** - **103** **K** **L04** **02** **(51)**  
**(1)**      **(2)**   **(3)**   **(4)**   **(5)**   **(6)**

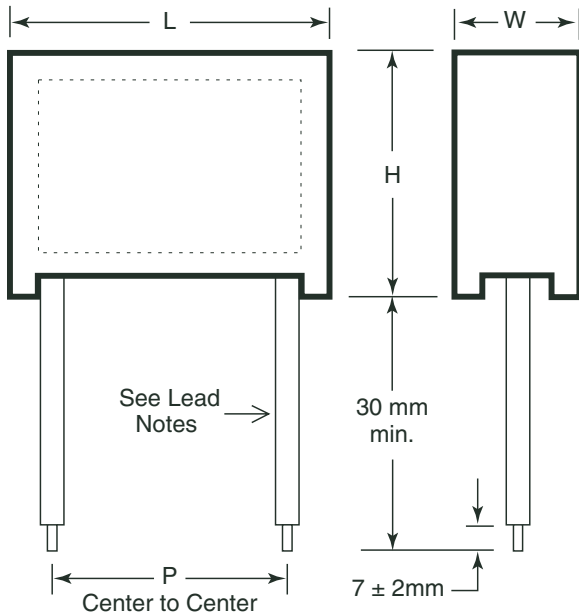
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|--|--|
| <p><b>(1) Metallized Polypropylene Film Suppressors(X2)</b><br/> <b>WXP</b> = WXP Series<br/> <b>WXPC</b> = WXPC Series</p> <p><b>(2) Capacitance</b><br/>         Example: <b>103</b> = 0.010<math>\mu</math>F<br/>         WXP Series available in 0.01-2.2<math>\mu</math>F<br/>         WXPC Series available in 0.01-6.8<math>\mu</math>F</p> <p><b>(3) Tolerance</b><br/> <b>K</b> = <math>\pm 10\%</math><br/> <b>M</b> = <math>\pm 20\%</math><br/> <b>J</b> = <math>\pm 5\%</math> (Only available for WXPC 2.2 - 6.8<math>\mu</math>F)</p> | <p><b>(4) Lead Lengths</b><br/> <b>Nil</b> = 30mm min<br/> <b>L04</b> = <math>4 \pm 1</math>mm<br/> <b>L05</b> = <math>5 \pm 1</math>mm<br/> <b>L06</b> = <math>6 \pm 1</math>mm</p> <p><b>(5) Lead Type</b><br/> <b>Nil</b> = Solid uninsulated wire <math>\phi = 0.8</math>mm diameter<br/> <b>02</b> = Solid cu wire, 0.8mm diameter, PCV insulated*<br/> <b>03</b> = Stranded cu wire, 0.5mm<sup>2</sup> PCV insulated*</p> <p><b>(6) Custom Lead Length suffix</b><br/>         Example: <b>(45)</b> = 45mm lead length**</p> |
|--|--|

\* All insulated leads have 7.0mm striped and tinned ends. These options are only available for types with 15mm or larger lead spacing (P).

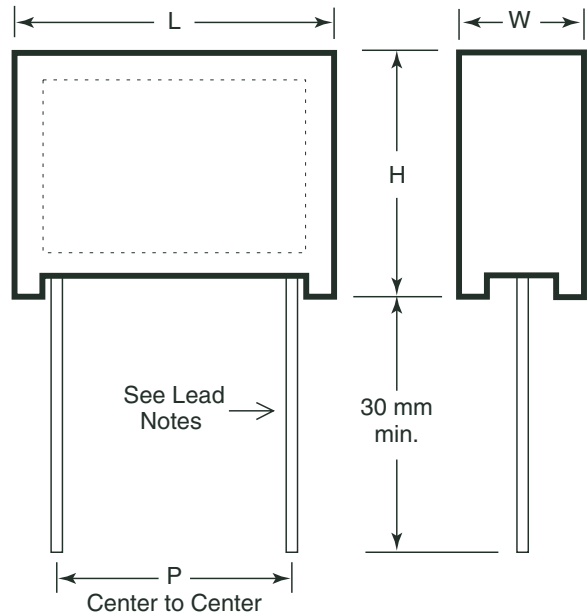
\*\* If longer lead length other than standard 30mm min is required that lead length is noted after the appropriate suffix 02 or 03 for insulated leads (i.e.: for 45mm lead length 02(45), 03(45) or in the case of uninsulated leads (45).)

#### Insulated Leads Versions

Only WXP and WXPC



#### Uninsulated Leads Versions



**WXP & WXPC Series (continued)****WXP Dimensions**

Part Number	L ± 0.3 mm	H ± 0.3 mm	W ± 0.3 mm	P mm	Quantity Per Box	
					Long Lead 30-35mm	Short Lead 4, 5, 6mm
WXP-103K	18.0	10.5	5.5	15.0±0.5	500	1300
WXP-153K	18.0	10.5	5.5	15.0±0.5	500	1300
WXP-223K	18.0	10.5	5.5	15.0±0.5	500	1300
WXP-333K	18.0	10.5	5.5	15.0±0.5	500	1300
WXP-473K	18.0	12.5	6.5	15.0±0.5	400	950
WXP-683K	18.0	13.5	7.5	15.0±0.5	400	750
WXP-104K	18.0	14.5	8.5	15.0±0.5	400	624
WXP-154K	26.5	15.5	7.5	22.5±0.5	200	498
WXP-224K	26.5	16.5	8.5	22.5±0.5	200	438
WXP-334K	26.5	18.5	10.5	22.5±0.5	150	330
WXP-474K	31.5	20.5	11.5	27.5±0.7	100	220
WXP-684K	31.5	23.5	13.5	27.5±0.7	100	150
WXP-105K	31.5	24.5	15.0	27.5±0.7	80	140
WXP-155K	41.5	28.5	16.0	37.5±0.7	40	80
WXP-225K	41.5	33.0	18.0	37.5±0.7	40	80

**WXPC Dimensions**

Part Number	L ± 0.3 mm	H ± 0.3 mm	W ± 0.3 mm	P mm	Quantity Per Box	
					Long Lead 30-35mm	Short Lead 4, 5, 6mm
WXPC-103K	13.0	10.5	4.5	10.0±0.5	1000	2200
WXPC-153K	13.0	10.5	4.5	10.0±0.5	1000	2200
WXPC-223K	13.0	10.5	5.5	10.0±0.5	1000	1800
WXPC-333K	13.0	12.5	5.5	10.0±0.5	800	1500
WXPC-473K1	18.0	10.5	5.5	15.0±0.5	500	1300
WXPC-683M	18.0	10.5	5.5	15.0±0.5	500	1300
WXPC-104K	18.0	12.5	6.5	15.0±0.5	500	950
WXPC-154K	18.0	14.5	8.5	15.0±0.5	400	650
WXPC-224K	18.0	17.0	8.5	15.0±0.5	300	550
WXPC-224K1	26.5	15.5	7.5	22.5±0.7	200	498
WXPC-274K	26.5	15.5	7.5	22.5±0.7	200	498
WXPC-334K	26.5	16.5	8.5	22.5±0.7	200	438
WXPC-474K	26.5	18.5	10.5	22.5±0.7	150	330
WXPC-684K	31.5	20.5	11.5	27.5±0.7	100	220
WXPC-105K	31.5	23.5	13.5	27.5±0.7	100	150
WXPC-155M	31.5	24.5	15.0	27.5±0.7	80	140
	L ± 0.5 mm	H ± 0.5 mm	W ± 0.5 mm			
WXPC-225K	41.5	28.5	16.0	37.5±0.7	40	80
WXPC-335K	41.5	33.0	18.0	37.5±0.7	40	80
WXPC-475K	42.0	38.0	21.0	37.5±0.7	40	45
WXPC-685M	42.0	38.0	21.0	37.5±0.7	40	45

**WXP & WXPC Series (continued)****WXP Specifications**

Part Number		Tolerance	dv/dt	Dissipation Factor (DF)	Insulation Resistance (IR)	Test Voltage for 1 second	Rated Voltage 50/60Hz to 440Hz	Typical Resonant Frequencies
	μF	%	v/μs	%	Note 4	VDC	VAC	fo - MHz
WXP-103K	0.010	±10	500	≤0.10% at 10kHz	≥30000MΩ	2150	300	13.0
WXP-153K	0.015	±10	500	≤0.10% at 10kHz	≥30000MΩ	2150	300	10.4
WXP-223K	0.022	±10	500	≤0.10% at 10kHz	≥30000MΩ	2150	300	8.5
WXP-333K	0.033	±10	500	≤0.10% at 10kHz	≥30000MΩ	2150	300	6.9
WXP-473K	0.047	±10	500	≤0.10% at 10kHz	≥30000MΩ	2150	300	6.0
WXP-683K	0.068	±10	500	≤0.10% at 10kHz	≥30000MΩ	2150	300	4.7
WXP-104K	0.100	±10	500	≤0.10% at 10kHz	≥30000MΩ	2150	300	4.0
WXP-154K	0.150	±10	300	≤0.50% at 10kHz	≥30000MΩ	2150	300	3.4
WXP-224K	0.220	±10	300	≤0.50% at 10kHz	≥30000MΩ	2150	300	2.7
WXP-334K	0.330	±10	300	≤0.50% at 10kHz	≥30000MΩ	2150	300	2.3
WXP-474K	0.470	±10	300	≤0.50% at 10kHz	≥10000ΩF	2150	300	1.9
WXP-684K	0.680	±10	300	≤0.50% at 10kHz	≥10000ΩF	2150	300	1.6
WXP-105K	1.00	±10	200	≤0.50% at 10kHz	≥10000ΩF	2150	300	1.3
WXP-155K	1.50	±10	200	≤0.10% at 1kHz	≥10000ΩF	2150	300	1.0
WXP-225K	2.20	±10	200	≤0.10% at 1kHz	≥10000ΩF	2150	300	0.85

1. All measurements are based on 5mm lead lengths at nominal C values.
2. Actual resonant frequencies will depend also on the total length of the circuit connections to the capacitor terminals and capacitor's actual C value.
3. Our factory tests each production lot for 100% to the test voltages listed above. After the test voltage has been applied, 100% of all production is tested for DF, IR and capacitance to insure all suppressors comply with electrical specifications.
4. Insulation Resistance (IR) is measured at 100VDC after 60 seconds at +25°C.
5. These specifications are for both ±10% and ±20% tolerance parts.



**WXP & WXPC Series (continued)****WXPC Specifications**

Part Number		Tolerance	dv/dt	Dissipation Factor (DF)	Insulation Resistance(IR)	Test Voltage for 1 second	Rated Voltage 50/60Hz to 440Hz	Typical Resonant Frequencies
	μF	%	v/μs	%	Note 4	VDC	VAC	fo - MHz
WXPC-473K1	0.047	±10	500	≤0.10% at 10kHz	≥30000MΩ	2150	275	6.0
WXPC-683M	0.068	±20	500	≤0.10% at 10kHz	≥30000MΩ	2150	275	4.7
WXPC-104K	0.100	±10	500	≤0.10% at 10kHz	≥30000MΩ	2150	275	4.0
WXPC-154K	0.150	±10	300	≤0.50% at 10kHz	≥30000MΩ	2150	275	3.4
WXPC-224K	0.22	±10	300	≤0.50% at 10kHz	≥30000MΩ	2150	275	2.7
WXPC-224K1	0.22	±10	300	≤0.50% at 10kHz	≥30000MΩ	2150	275	2.7
WXPC-274K	0.27	±10	300	≤0.50% at 10kHz	≥30000MΩ	2150	275	2.5
WXPC-334K	0.33	±10	300	≤0.50% at 10kHz	≥30000MΩ	2150	275	2.3
WXPC-474K	0.47	±10	300	≤0.50% at 10kHz	≥10000ΩF	2150	275	1.9
WXPC-684K	0.68	±10	300	≤0.50% at 10kHz	≥10000ΩF	2150	275	1.6
WXPC-105K	1.0	±10	200	≤0.50% at 10kHz	≥10000ΩF	2150	275	1.3
WXPC-155M	1.5	±20	200	≤0.10% at 1kHz	≥10000ΩF	2150	275	1.0
WXPC-225K	2.2	±10	100	≤0.10% at 1kHz	≥10000ΩF	2150	300	0.85
WXPC-335K	3.3	±10	100	≤0.10% at 1kHz	≥10000ΩF	2150	300	-
WXPC-475K	4.7	±10	100	≤0.10% at 1kHz	≥10000ΩF	2150	300	-
WXPC-685M	6.8	±20	100	≤0.10% at 1kHz	≥10000ΩF	2150	300	-

1. All measurements are based on 5mm lead lengths at nominal C values.
2. Actual resonant frequencies will depend also on the total length of the circuit connections to the capacitor terminals and capacitor's actual C value.
3. Our factory tests each production lot for 100% to the test voltages listed above. After the test voltage has been applied, 100% of all production is tested for DF, IR and capacitance to insure all suppressors comply with electrical specifications.
4. Insulation Resistance (IR) is measured at 100VDC after 60 seconds at +25°C.
5. These specifications are for 0.01 - 1.5μF for ±10% and ±20% tolerance and 2.2 - 6.8μF for ±5%, ±10%, and ±20% tolerance parts.

## WYP Series

### Part Numbering System

#### Metallized Polypropylene Film Capacitors

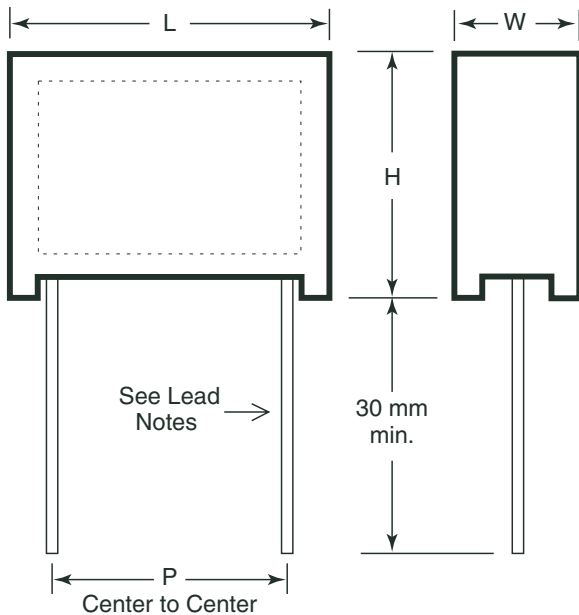
Example:

**WYP** - **103** **M** **L04** **(51)**  
**(1)**      **(2)**   **(3)**   **(4)**   **(5)**

- (1) Metallized Polypropylene Film Suppressors(Y2)**  
**WYP** = WYP Series
  
- (2) Capacitance**  
 Example: **103** = 0.010 $\mu$ F  
 WYP Series available in 0.01-0.1 $\mu$ F
  
- (3) Tolerance**  
**M** =  $\pm 20\%$
  
- (4) Lead Lengths**  
**Nil** = 30mm min, Solid uninsulated wire  $\phi$  = 0.8mm diameter  
**L04** = 4  $\pm$  1mm, Solid uninsulated wire  $\phi$  = 0.8mm diameter  
**L05** = 5  $\pm$  1mm, Solid uninsulated wire  $\phi$  = 0.8mm diameter  
**L06** = 6  $\pm$  1mm, Solid uninsulated wire  $\phi$  = 0.8mm diameter
  
- (5) Custom Lead Length suffix**  
 Example: **(45)** = 45mm lead length\*

\* If longer lead length other than standard 30mm min is required that lead length is noted after the part number (i.e.: for 45mm lead length (45).)

### Uninsulated Leads Versions



**WYP Series (continued)****WYP Dimensions**

Part Number	L ±0.3 mm	H ±0.3 mm	W ±0.3 mm	P ±0.5 mm	Quantity Per Box	
					Long Lead 30-35mm	Short Lead 4, 5, 6mm
WYP-103M	18.0	10.5	5.5	15.0	500	1300
WYP-153M	18.0	12.5	6.5	15.0	400	950
WYP-223M	18.0	13.5	7.5	15.0	400	750
WYP-273M	18.0	14.5	8.5	15.0	400	650
WYP-333M	18.0	17.0	8.5	15.0	300	550
WYP-473M	26.5	15.5	7.5	22.0	200	480
WYP-683M	26.5	16.5	8.5	22.0	200	400
WYP-104M	26.5	18.5	10.5	22.5	150	330

**WYP Specifications**

Part Number		Tolerance	dv/dt	Dissipation Factor (DF)	Insulation Resistance (IR)	Test Voltage for 2 seconds	Rated Voltage 50/60Hz to 440Hz	Typical Resonant Frequencies
	µF	%	v/µs	% at 10kHz	MΩ	VDC	VAC	fo - MHz
WYP-103M	0.010	±20	700	≤0.08	≥30000	2700	275	15
WYP-153M	0.015	±20	700	≤0.08	≥30000	2700	275	12
WYP-223M	0.022	±20	700	≤0.08	≥30000	2700	275	10
WYP-273M	0.027	±20	700	≤0.08	≥30000	2700	275	8.1
WYP-333M	0.033	±20	700	≤0.08	≥30000	2700	275	6.9
WYP-473M	0.047	±20	500	≤0.08	≥30000	2700	275	5.5
WYP-683M	0.068	±20	500	≤0.08	≥30000	2700	275	4.7
WYP-104M	0.100	±20	500	≤0.08	≥30000	2700	275	4.0

1. All measurements are based on 5mm lead lengths at nominal C values.
2. Actual resonant frequencies will depend also on the total length of the circuit connections to the capacitor terminals and capacitor's actual C value.
3. Our factory tests each production lot for 100% to the test voltages listed above. After the test voltage has been applied, 100% of all production is tested for DF, IR and capacitance to insure all suppressors comply with electrical specifications.

## WYE Series

### Part Numbering System

#### Metallized Polyester Film Capacitors

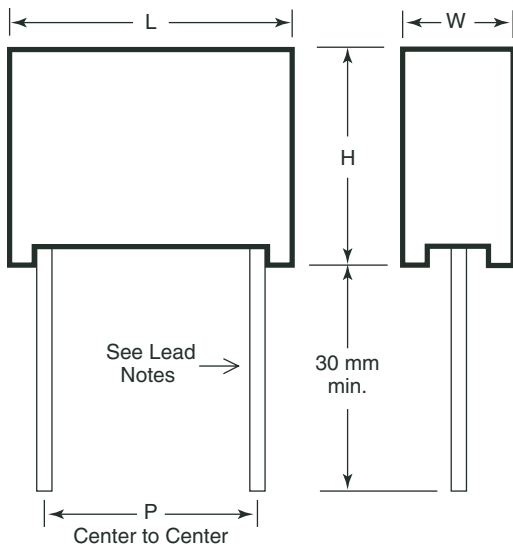
Example:

**WYE** - **102** **M** **L04** **(51)**  
**(1)**      **(2)**   **(3)**   **(4)**   **(5)**

- (1) Metallized Polyester Film Capacitors(Y2)**  
**WYE** = WYE Series
  
- (2) Capacitance**  
 Example: **103** = 0.010 $\mu$ F  
 WYE Series available in 0.001-0.0068 $\mu$ F
  
- (3) Tolerance**  
**M** =  $\pm$ 20%
  
- (4) Lead Lengths**  
**Nil** = 30mm min, Solid uninsultated wire  $\phi$  = 0.8mm diameter  
**L04** = 4  $\pm$  1mm, Solid uninsultated wire  $\phi$  = 0.8mm diameter  
**L05** = 5  $\pm$  1mm, Solid uninsultated wire  $\phi$  = 0.8mm diameter  
**L06** = 6  $\pm$  1mm, Solid uninsultated wire  $\phi$  = 0.8mm diameter
  
- (5) Custom Lead Length suffix**  
 Example: **(45)** = 45mm lead length\*

\* If longer lead length other than standard 30mm min is required that lead length is noted after the part number (i.e.: for 45mm lead length (45).)

#### Uninsulated Leads



**WYE Series (continued)****WYE Dimensions**

Part Number	L max mm	H max mm	W max mm	P ±0.5 mm	Quantity Per Box	
					Long Lead 30-35mm	Short Lead 4, 5, 6mm
WYE-102M	13.0	10.5	4.5	10.0	1000	2200
WYE-152M	13.0	10.5	4.5	10.0	1000	2200
WYE-222M	13.0	10.5	5.8	10.0	1000	1800
WYE-252M	13.0	10.5	5.8	10.0	1000	1800
WYE-332M	13.0	12.5	5.8	10.0	800	1500
WYE-392M	13.0	12.5	5.8	10.0	800	1500
WYE-472M	13.0	13.5	5.8	10.0	800	1400
WYE-682M	18.0	14.0	5.8	15.0	500	1000

**WYE Specifications**

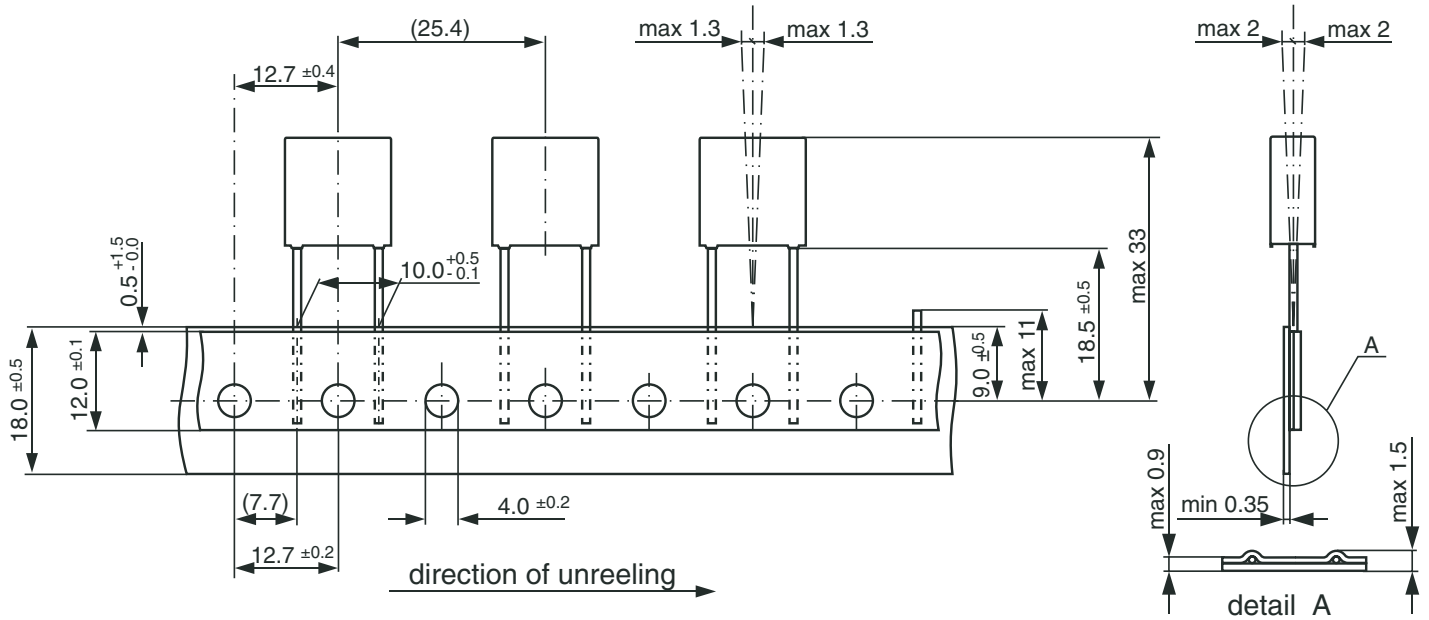
Part Number	Capacitance	Tolerance	dv/dt	Dissipation Factor (DF)	Insulation Resistance (IR)	Test Voltage for 2 seconds	Rated Voltage 50/60Hz	Typical Resonant Frequencies
	µF	%	v/µs	% at 1KHz	MΩ	VDC	VAC	fo - MHz
WYE-102M	0.0010	±20	1000	≤0.8	≥30000	3000	250	53
WYE-152M	0.0015	±20	1000	≤0.8	≥30000	3000	250	42
WYE-222M	0.0022	±20	1000	≤0.8	≥30000	3000	250	35
WYE-252M	0.0025	±20	1000	≤0.8	≥30000	3000	250	33
WYE-332M	0.0033	±20	1000	≤0.8	≥30000	3000	250	29
WYE-392M	0.0039	±20	1000	≤0.8	≥30000	3000	250	25
WYE-472M	0.0047	±20	1000	≤0.8	≥30000	3000	250	21
WYE-682M	0.0068	±20	600	≤0.8	≥30000	2700	250	19

1. All measurements are based on 5mm lead lengths at nominal C values.
2. Actual resonant frequencies will depend also on the total length of the circuit connections to the capacitor terminals and capacitor's actual C value.
3. Our factory tests each production lot for 100% to the test voltages listed above. After the test voltage has been applied, 100% of all production is tested for DF, IR and capacitance to insure all suppressors comply with electrical specifications.

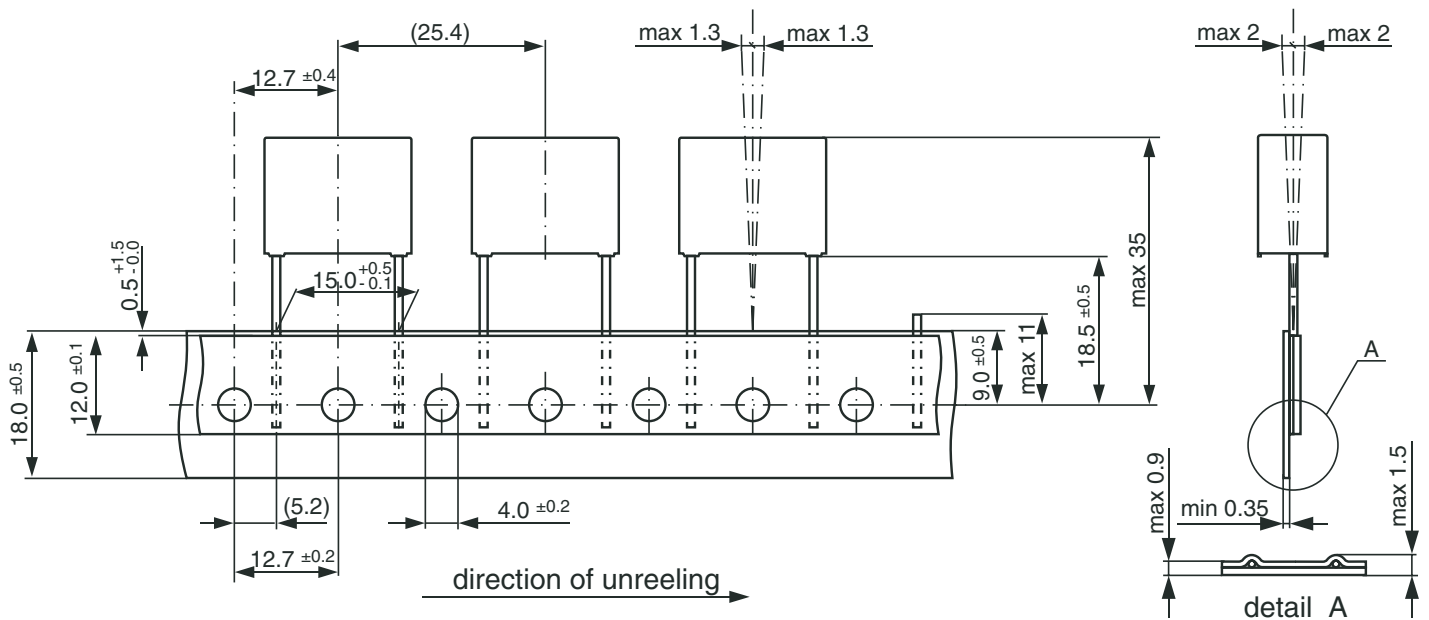
## Taping Specifications

### Taping of Capacitors

The original lead spacing of 10.0 mm (suffix code – T1)  
 (the pitch of holes on carrier tape = 12.7 mm) (All dimensions in mm)



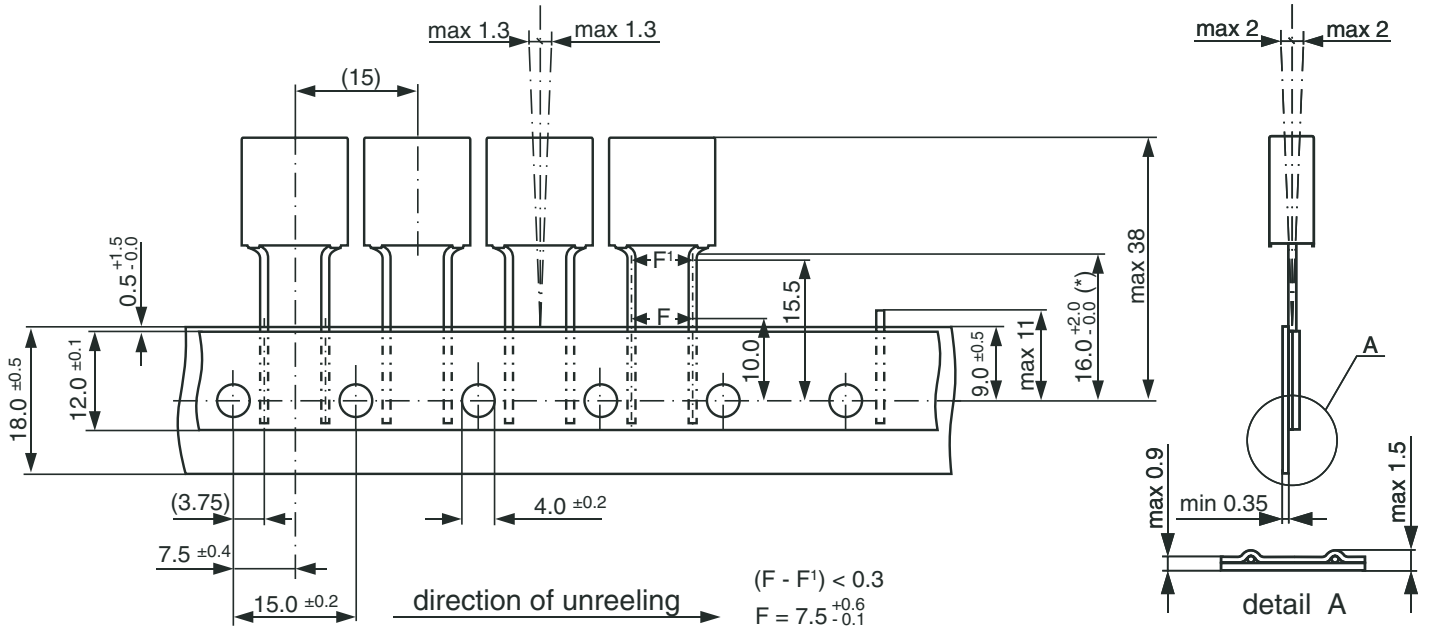
The original lead spacing of 15.0 mm (suffix code – T2)  
 (the pitch of holes on carrier tape = 12.7 mm) (All dimensions in mm)



## Taping Specifications (continued)

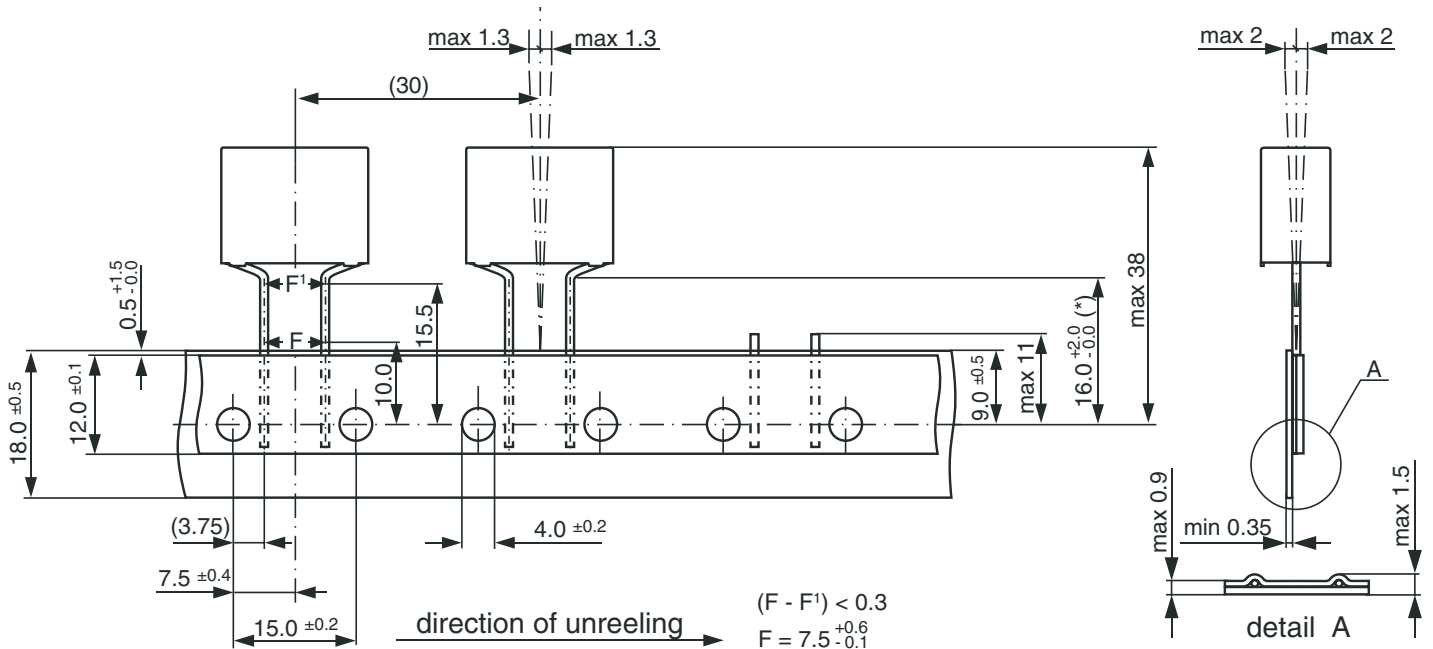
### Taping of Capacitors

The original lead spacing of 10.0 mm crimped to the lead spacing of 7.5 mm (suffix code – T3)  
 (the pitch of holes on carrier tape = 15.0 mm) (All dimensions in mm)



(\*) The distance between reference plane and hole symmetry axis.

The original lead spacing of 15.0 mm crimped to the lead spacing of 7.5 mm (suffix code – T4)  
 (the pitch of holes on carrier tape = 15.0 mm) (All dimensions in mm)



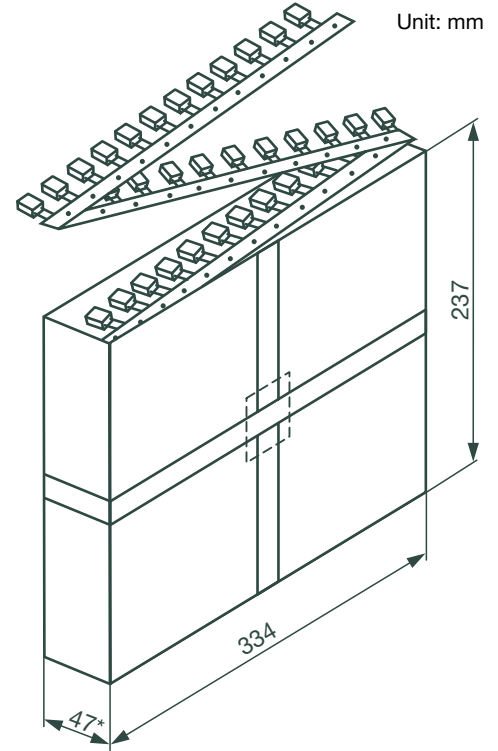
(\*) The distance between reference plane and hole symmetry axis.

## Taping Specifications (continued)

### Packaging of Capacitors

#### AMMO Packing

Capacitor case dimension (W x H x L)	Lead spacing	Number of taped capacitors per box
mm	mm	pcs
4.5 x 10.5 x 13.0	10.0	516
5.5 x 10.5 x 13.0	10.0	420
5.5 x 12.5 x 13.0	10.0	420
5.5 x 13.5 x 13.0	10.0	420
5.5 x 10.5 x 18.0	15.0	420
5.5 x 14.0 x 18.0	15.0	420
6.5 x 12.5 x 18.0	15.0	360
7.5 x 13.5 x 18.0	15.0	312
8.5 x 14.5 x 18.0	15.0	276
8.5 x 17.0 x 18.0	15.0	276*
4.5 x 10.5 x 13.0	10.0 / 7.5	860
5.5 x 10.5 x 13.0	10.0 / 7.5	700
5.5 x 12.5 x 13.0	10.0 / 7.5	700
5.5 x 13.5 x 13.0	10.0 / 7.5	700
5.5 x 10.5 x 18.0	15.0 / 7.5	350
5.5 x 14.0 x 18.0	15.0 / 7.5	350
6.5 x 12.5 x 18.0	15.0 / 7.5	300
7.5 x 13.5 x 18.0	15.0 / 7.5	260
8.5 x 14.5 x 18.0	15.0 / 7.5	230
8.5 x 17.0 x 18.0	15.0 / 7.5	230*



#### Requirements

1. A maximum of 2 consecutive capacitors may be missing provided this gap is followed by 6 consecutive capacitors.
2. The maximum number of empty places per reel shall not exceed 0.5% of the total number of the capacitors per reel.
3. Cumulative pitch error over 20 pitches:  $\pm 1.0$  mm.
4. The other taping requirements: acc. to EN/IEC 60286-2 & EIA-468-B.

\*52mm for .22uF.



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