WXE & WYE Series RFI Suppressors - Second Edition

Publication Date: **January 1, 1996**

Company: **WORLD PRODUCTS INC**

Featuring...

- International Safety Approvals
- Excellent Self Healing Properties
- Exremely High Dv/Dt Ratings
- Flame Retardant Encapsulation
- 100% Production Lot Testing
- Standard Electrical AQL – 0.065

General Specifications...

	X2 – WXE	*Y2 – WYE*
■ Capacitance Range	0.01 – 2.2µF	0.001 – 0.022µF
■ Rated Voltage	275 VAC, 0 – 50/60Hz	250 VAC, 0 – 50/60Hz
■ Climatic Category	IEC 40/100/56	IEC 40/100/56
■ Temperature Range	-40 to +100°C	-40 to +100°C

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 is expressed in percentage (%). DF is an important specification for suppressors used on AC Mains. High dielectric loss causes internal heating due to energy being dissipated in the suppressor winding which may lead to destructive breakdown. If the suppressor is used according to its specified limits, destructive breakdown will not occur. All of our suppressors are designed and manufactured utilizing top quality materials in order to minimize dielectric loss.

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 384–14, and IEC 68–2, 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 specific Rated Temperature range.

Rated Temperature Range

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

Endurance Life Test

Production samples are subjected to a periodic life endurance test 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 (Y) (i.e. 345VAC and 425VAC respectively) applied for a period of 1,008 hours at an elevated temperature of 85° C. We test our WXE and 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, 1000VAC is applied once each hour for 0.1 second. Both the steady state and momentary (0.1 sec) 1000VAC 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 1%. 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 voltage rate of change per μsec of rise or fall time.

$$Dv/Dt = \frac{V_R}{R \times C}$$

V_R = Rated DC Voltage
R = Discharge Resistor
C = Rated Capacitance

Electrical Specifications

Dissipation Factor (DF)	≤ 0.8% at 1kHz		
Insulation Resistance (IR)	≤ 0.33 µF , ≥ 30000 Mohm > 0.33 µF , ≥ 10000 Ohm Farads Measured at 100 VDC after 60 sec, +25°C		
Test Voltage	X Class	1850 VDC C ≥ 1µF	2 seconds
		2000 VDC C ≤ .68µF	2 seconds
	Y Class	2700 VDC C ≥ .0068µF	2 seconds
		3000 VDC C ≤ .0047µF	2 seconds

Our factory tests each production lot 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.

Mechanical Specifications

Dimensions	See the Dimension Table	
Vibration	IEC 68 – 2 – 6, test Fc	3 directions at 2 hours each 10–500 Hz at 98 m/s²
Bump	IEC 68 – 2 – 29, test Eb	4000 Bumps at 390 m/s²
Solderability	Mil Std 202E, Method 208C IEC 68 – 2 – 20, test Tc	
Fire Hazard	UL 1414 IEC 695 – 2 – 2	According to Section 18 in this Standard For P ≥ 15mm, 120 sec For P ≤ 15mm, 60 sec
Humidity	IEC 68 – 2 – 3, test Ca	X Class 56 days Y Class 56 days
Plastic Case	UL 94V – 0	Flame Retardant, Molded Plastic, Epoxy Resin Sealed

Y Class Resonant fo

Type	C (µF) ± 20%	fo - MHz
WYE-102M	0.001	53
WYE-152M	0.0015	42
WYE-222M	0.0022	35
WYE-252M	0.0025	33
WYE-332M	0.0033	29
WYE-392M	0.0039	25
WYE-472M	0.0047	21
WYE-682M	0.0068	19
WYE-103M	0.01	15
WYE-153M	0.015	12
WYE-223M	0.022	10

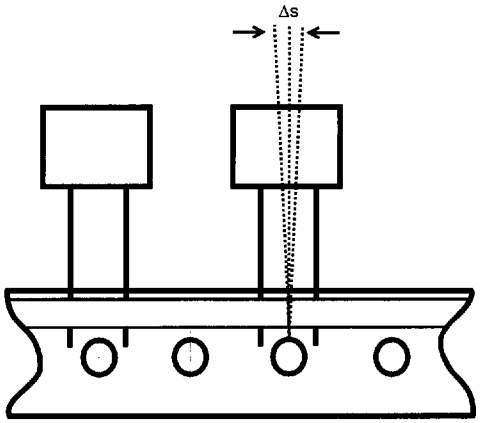
X Class Resonant fo

Type	C (µF) ± 10%	fo - MHz
WXE-103K	0.01	13
WXE-153K	0.015	10.4
WXE-223K	0.022	8.5
WXE-333K	0.033	6.9
WXE-473K	0.047	6.0
WXE-683K	0.068	4.7
WXE-104K	0.1	4.0
WXE-154K	0.15	3.4
WXE-224K	0.22	2.7
WXE-334K	0.33	2.3
WXE-474K	0.47	1.9
WXE-684K	0.68	1.6
WXE-105K	1.0	1.3
WXE-155K	1.5	1.0
WXE-225K	2.2	0.85

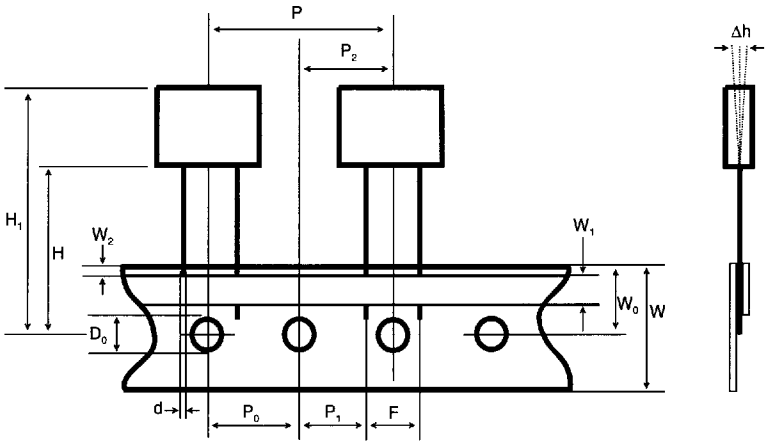
(1) All measurements are based on 5mm lead lengths at nominal C values.

(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. The tolerances for our capacitors are: ± 10% for X2 (WXE Series), ±20% for Y (WYE Series).

Tape Positioning



PCM 10



PCM 15

Physical positioning on tape per EIA 468-A/IEC40 (co)544

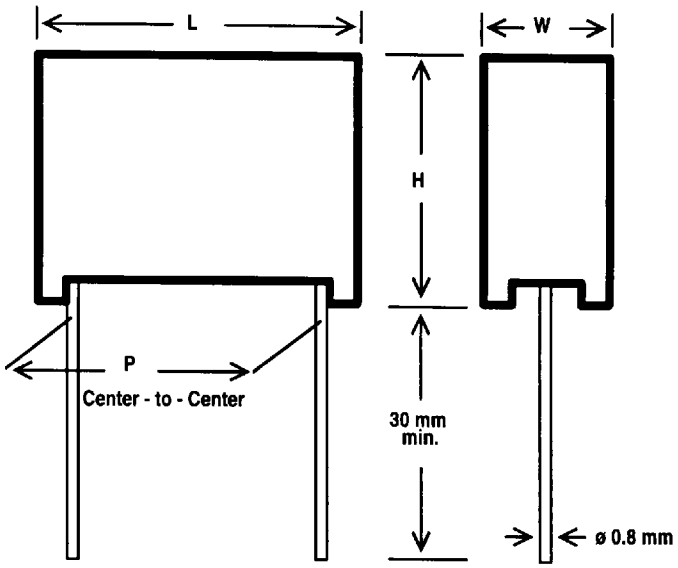
Taping Specifications

Item	Symbol	Dimensions in mm PCM 10	PCM 15	Tolerance
Carrier Tape Width	W	18.0	18.0	±0.5
Hold–Down Tape Width	W_1	6.0	6.0	±0.3
Pitch of Component	P	25.4	25.4	±1
Hole Center to Comp. Center	P_2	12.7	12.7	±1.3
Feed Hole Center to Lead	P_1	7.7	5.2	±0.7
Height of Component From Tape Center	H	16.0	16.0	±0.5
Hold–Down Tape Position	W_2	0–2	0–2	0–2
Hole Position	W_0	9.0	9.0	0.3
Feed Hole Pitch	P_0	12.7	12.7	±0.2
Feed Hole Diameter	D_0	4.0	4.0	±0.2
Lead Wire Diameter	d	0.8	0.8	±0.05
Component Alignments	Δs	±1.0	±1.0	max.
	Δh	±1.0	±1.0	max.
Lead Spacing	F	10	15	±0.4
Component Height	H_1	40	43	max.
Extraction Force for Components	F_1	5	5	min. [N]
Break Force of the Tape	F_2	15	15	min. [N]

1) Cumulative pitch error over 20 x P_0 distance - 1.0 mm max

2) Leads may protrude beyond hold–down tape but no more than to feed hole centers.

Physical Dimensions



Safety Approval References

Symbol	Country	Reference	X2 File Number	Y File Number
CSA	Canada	22.2 No. 1 & No. 8	LR86091	LR86091
D	Denmark	*	117323JJa	117324JJa
FI	Finland	*	180398-01	180397-01
GOST	Russia	12.2006-87/IEC65/IEC384	R90009	R90009
IMQ	Italy	CEI 40-7/V1-1980	V3875	V3876
N	Norway	*	P95100026	E43558
OVE	Austria	OVE-F22/179	348556-13115	348556-13115
S	Sweden	*	9447241	9409048
SEV	Switzerland	*	93, 1 01346, 02	93,1 01346, 06
UL	USA	UL 1283	E119899	E119899
UL	USA	UL 1414	E71602	E71602
VDE	Germany	*	83647	87425

**Approval Test Standards: EN 132400, 1994/IEC 384-14 2nd edition, 1993*

NOTE: WXE-684K through WXE-225K do not have UL1414 and CSA 22.2 No. 1 approvals.

WXE Specifications

Part Number	Capacitance (µF)	DV/Dt	L max mm	H max mm	W max mm	P ±0.4 mm	Quantity Per Box
WXE-103K	0.01	1200	18.0	10.5	5.5	15.0	500
WXE-153K	0.015	1200	18.0	10.5	5.5	15.0	500
WXE-223K	0.022	1200	18.0	10.5	5.5	15.0	500
WXE-333K	0.033	1200	18.0	10.5	5.5	15.0	500
WXE-473K	0.047	1200	18.0	12.5	6.5	15.0	400
WXE-683K	0.068	1200	18.0	13.5	7.5	15.0	400
WXE-104K	0.1	600	18.0	14.5	8.5	15.0	400
WXE-154K	0.15	600	26.5	15.5	7.5	22.5	200
WXE-224K	0.22	600	26.5	16.5	8.5	22.5	200
WXE-334K	0.33	400	26.5	18.5	10.5	22.5	150
WXE-474K	0.47	400	31.5	20.5	11.5	27.5	100
WXE-684K	0.68	400	31.5	23.5	13.5	27.5	100
WXE-105K	1.0	400	31.5	24.5	15.0	27.5	75
WXE-155K	1.5	400	41.5	28.5	16.0	37.5	50
WXE-225K	2.2	400	41.5	33.0	18.0	37.5	50

WYE Specifications

Part Number	Capacitance (µf)	Dv/Dt	L max mm	H max mm	W max mm	P ±0.4 mm	Quantity Per Box
WYE-102M	0.001	2000	13.0	10.5	4.5	10.0	1000
WYE-152M	0.0015	2000	13.0	10.5	4.5	10.0	1000
WYE-222M	0.0022	2000	13.0	10.5	5.5	10.0	1000
WYE-252M	0.0025	2000	13.0	10.5	5.5	10.0	1000
WYE-332M	0.0033	2000	13.0	12.5	5.5	10.0	800
WYE-392M	0.0039	2000	13.0	12.5	5.5	10.0	800
WYE-472M	0.0047	2000	13.0	13.5	5.5	10.0	800
WYE-682M	0.0068	1400	18.0	14.0	5.5	15.0	500
WYE-103M	0.01	1400	18.0	13.5	7.5	15.0	400
WYE-153M	0.015	1400	18.0	14.5	8.5	15.0	400
WYE-223M	0.022	1400	18.0	17.0	8.5	15.0	300

Ordering Information & Notes

Suppressor Type	Value Code	Suppressor Tolerance	Special Codes
WXE	104	K = ± 10%	*LOX (Leadcut)
WYE	472	M = ± 20%	*LOX (Leadcut)

* = *Leadcut lengths are 4mm, 5mm and 6mm, add suffix L04, L05 or L06 respectively. Lead length tolerance is +0–1mm.*

1. Value Code = First two digits significant, last digit is the number of zeros for C value expressed in pF (picoFarads.)
2. Standard lead length is 30mm minimum.
3. Suppressors should be ordered according to the standard box quantity listed in the dimensions table. Ordering in multiples other than the standard box quantity is subject to a surcharge established at the time of order placement. Taped components are available upon request, suffix code TA (ammo box).
4. WXE series are available only with 10% (K) tolerance. WYE series are available only with 20% (M) tolerance.
5. Ammo Box – Dimensions are L = 320, H = 245, W = 52 (millimeters). Standard quantities per ammo box are:

500 pieces per box WYE - 102, - 152

400 pieces per box WXE - 103, - 153, - 222, - 333
WYE - 222, - 252, - 332, - 392, - 472, - 682

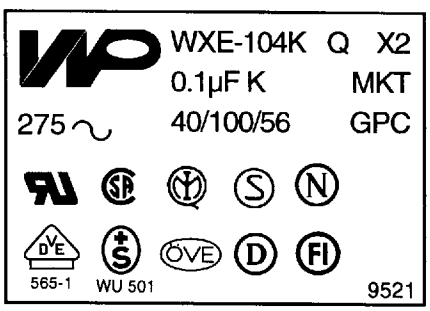
350 pieces per box WXE - 473

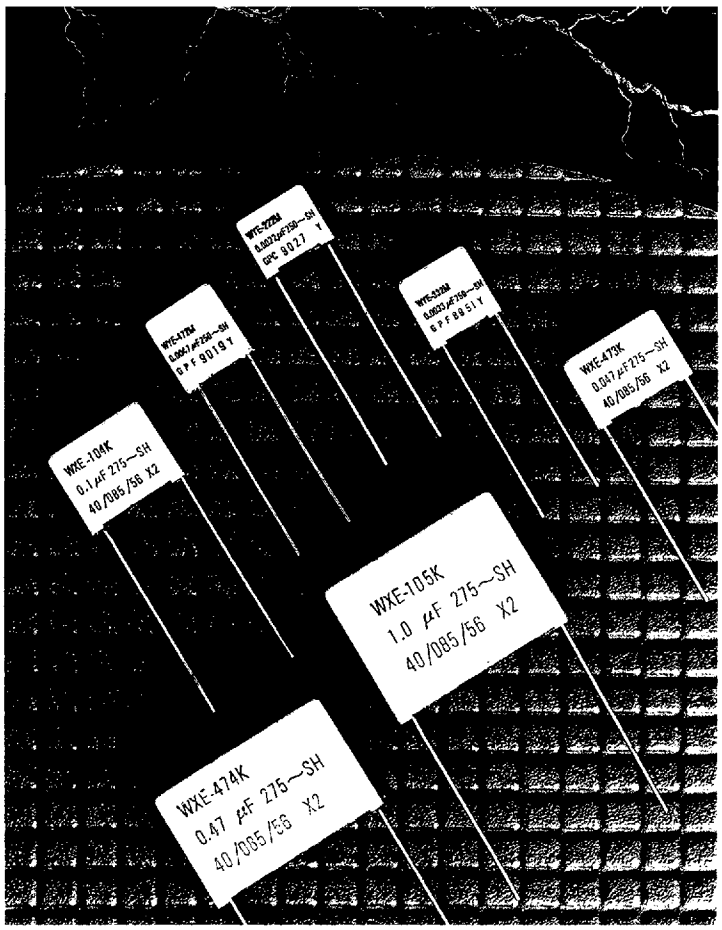
300 pieces per box WXE - 683
WYE - 103

250 pieces per box WXE - 104
WYE - 153, - 223

Marking & Packaging

World Products Inc. Logo
Part Number & Manufacturing Plant Code
Capacitance
Rated Voltage
SH for Self Healing
X2 or Y2 Class
Climatic Category, according to IEC 68 – 2, Appendix A
Safety Approval Marks
EIA Date Code





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