SPECIFICATION FOR APPROVAL

File No.: Q/FRK 0.GS.E094-V03

Product Name: Box-type double sided metallized polypropylene film capacitor

Product Type: MMKP84

Product Code:

Customer:

Customer Code:

Issue Date: Apr. 2007

Xiamen Faratronic Co. Ltd.			Approved by Customer
Drafted	Checked	Approved	
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Box-type double sided metallized polypropylene film capacitor(MMKP84)

Purchase Specification

MMKP84 250VAC 104 K P15.0

- P15.0 — Lead shaping and pitch
- K — Capacitance tolerance
- 104 — Rated capacitance (the first two digits indicate significant figure of capacitance value, the last digit indicates the number of zeros that must be added to obtain the Rated Capacitance in pF, i.e.:104 =10 0000 pF)
- 250VAC — Rated voltage
- MMKP84 — Type

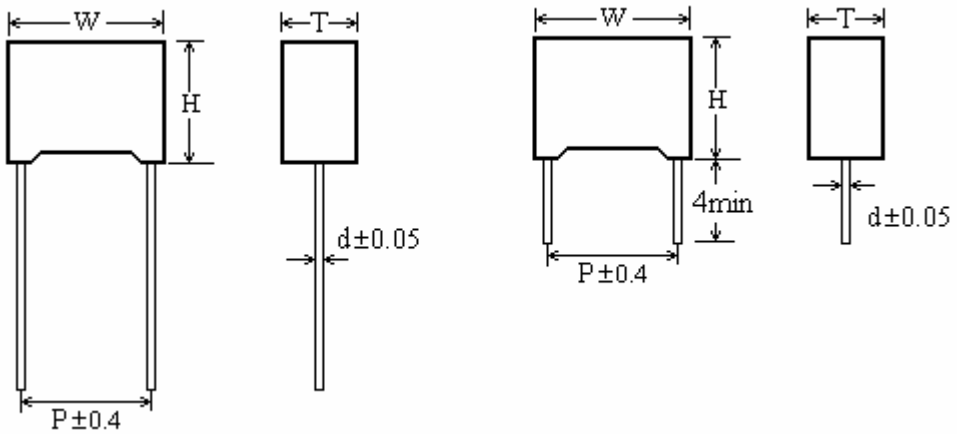
1. Capacitance tolerance

Capacitance tolerance	±3%	±5%	±10%	±20%
Code	H	J	K	M

2. Lead form:
Straight lead (Code: P)

Code	P5.0	P7.5	P10.0	P15.0	P22.5	P27.5
Lead pitch	5.0mm	7.5mm	10.0mm	15.0mm	22.5mm	27.5mm
Note	Pitch in common use					

Product Outline Drawing



1 Feature:

The capacitors are wound with double-sided metallized films and polypropylene films. Radical lead, plastic case, thermosetting resin filled, It is excellent of electric property and suitable for deflection circuits in TV-sets (S-correction and fly-black tuning) and monitors, switching spikes suppression in SMPS, lamp capacitors for electronic ballast and compact lamps, Snubber and SCR commutating circuits, applications with high voltage and high current.

2 Reference standards:

GB 2693 IEC 60384-1	Fixed capacitors for use in electronic equipment Part 1:General specification
GB/T 14579 IEC 60384-17	Fixed capacitors for use in electronic equipment Part 17: Sectional specification: Fixed metallized polypropylene film dielectric a.c. and pulse capacitors
GB 2828	Sampling procedures and tables for lot-by-lot inspection by attributes (Apply to inspection of successive lots or batches)
GB 2829	Sampling procedures and tables for periodic inspection by attributes (Apply to inspection of stability for productive process)
IEC 410	Sampling plans and procedures for inspection by attributes

3 Dimensions: refer to table 1

4 Specification: refer to table2

5 Quality Ensuring test (before shipment):

Inspection item (each batch)	Inspection level (GB 2828)	
	IL	AQL %
1.Appearance inspection	S-4	2.5
2.Dimensions		
1.Capacitance	II	1.0
2.Tangent of the loss angle		
3.Dielectric strength		
4.Insulation resistance		
1.Solderability	S-3	2.5

Box-type double sided metallized polypropylene film capacitor（MMKP84）

Table 1 Dimensions of MMKP84 unit:mm

Lead Pitch(P)	≤10	>10
Lead Wire Dia.(d±0.05)	0.6	0.8
Dimension Tolerance (W, H, T)	W+0.4/-0.7, H±0.4, T±0.4	

C (μF)	250VAC						300VAC					
	P=10			P=15.0			P=15.0			P=22.5		
	W	H	T	W	H	T	W	H	T	W	H	T
0.010	13.0	9.0	4.0				18.0	11.0	5.0			
0.012	13.0	9.0	4.0				18.0	11.0	5.0			
0.015	13.0	11.0	5.0				18.0	11.0	5.0			
0.018	13.0	12.0	6.0				18.0	11.0	5.0			
0.022	13.0	12.0	6.0				18.0	12.0	6.0			
0.027				18.0	12.0	6.0	18.0	12.0	6.0			
0.033				18.0	12.0	6.0	18.0	13.5	7.5			
0.039				18.0	12.0	6.0	18.0	13.5	7.5			
0.047				18.0	13.5	7.5	18.0	14.5	8.5			
0.056				18.0	13.5	7.5	18.0	16.0	10.0	26.5	15.0	6.0
0.068				18.0	14.5	8.5	18.0	16.0	10.0	26.5	16.0	7.0
0.082				18.0	16.0	10.0				26.5	17.0	8.5
0.10				18.0	16.0	10.0				26.5	17.0	8.5

Table 1(continued) **Dimensions of MKP84** unit:mm

C (μF)	400 VAC						500 VAC								
	P=15.0			P=22.5			P=15.0			P=22.5			P=27.5		
	W	H	T	W	H	T	W	H	T	W	H	T	W	H	T
0.0010							18.0	11.0	5.0						
0.0012							18.0	11.0	5.0						
0.0015							18.0	11.0	5.0						
0.0018							18.0	11.0	5.0						
0.0022							18.0	11.0	5.0						
0.0027							18.0	11.0	5.0						
0.0033							18.0	11.0	5.0						
0.0039							18.0	11.0	5.0						
0.0047							18.0	11.0	5.0						
0.0056	18.0	11.0	5.0				18.0	11.0	5.0						
0.0068	18.0	11.0	5.0				18.0	12.0	6.0						
0.0082	18.0	11.0	5.0				18.0	12.0	6.0						
0.010	18.0	12.0	6.0				18.0	13.5	7.5						
0.012	18.0	12.0	6.0				18.0	13.5	7.5						
0.015	18.0	13.5	7.5				18.0	14.5	8.5						
0.018	18.0	13.5	7.5				18.0	16.0	10.0	26.5	15.0	6.0			
0.022	18.0	14.5	8.5				18.0	16.0	10.0	26.5	16.0	7.0			
0.027	18.0	16.0	10.0	26.5	15.0	6.0				26.5	16.0	7.0			
0.033	18.0	16.0	10.0	26.5	16.0	7.0				26.5	17.0	8.5			
0.039				26.5	16.0	7.0				26.5	18.5	10.0			
0.047				26.5	17.0	8.5				26.5	18.5	10.0			
0.056				26.5	17.0	8.5				26.5	22.0	12.0			
0.068				26.5	18.5	10.0							32.0	20.0	11.0
0.082				26.5	18.5	10.0							32.0	20.0	11.0
0.10				26.5	22.0	12.0							32.0	22.0	13.0

Box-type double sided metallized polypropylene film capacitor（MMKP84）

Table 1(continued) **Dimensions of MMKP84** unit:mm

C (μF)	700VAC									900VAC		
	P=15.0			P=22.5			P=27.5			P=22.5		
	W	H	T	W	H	T				W	H	T
0.0010	18.0	11.0	5.0							26.5	15.0	6.0
0.0012	18.0	11.0	5.0							26.5	15.0	6.0
0.0015	18.0	11.0	5.0							26.5	15.0	6.0
0.0018	18.0	11.0	5.0							26.5	15.0	6.0
0.0022	18.0	11.0	5.0							26.5	15.0	6.0
0.0027	18.0	12.0	6.0							26.5	15.0	6.0
0.0033	18.0	12.0	6.0							26.5	15.0	6.0
0.0039	18.0	13.5	7.5							26.5	15.0	6.0
0.0047	18.0	13.5	7.5							26.5	15.0	6.0
0.0056	18.0	14.5	8.5							26.5	15.0	6.0
0.0068	18.0	14.5	8.5							26.5	16.0	7.0
0.0082	18.0	16.0	10.0	26.5	15.0	6.0				26.5	16.0	7.0
0.010	18.0	16.0	10.0	26.5	15.0	6.0				26.5	17.0	8.5
0.012				26.5	16.0	7.0				26.5	18.5	10.0
0.015				26.5	17.0	8.5				26.5	18.5	10.0
0.018				26.5	18.5	10.0	32.0	18.0	9.0	26.5	22.0	12.0
0.022				26.5	18.5	10.0	32.0	18.0	9.0	26.5	22.0	12.0
0.027				26.5	22.0	12.0	32.0	18.0	9.0			
0.033				26.5	22.0	12.0	32.0	20.0	11.0			
0.039							32.0	20.0	11.0			
0.047							32.0	22.0	13.0			
0.056							32.0	22.0	13.0			
0.068							32.0	24.5	15.0			
0.082							32.0	28.0	14.0			
0.10							32.0	33.0	18.0			
0.12							32.0	33.0	18.0			

Table 2 Specification (MMKP84)

NO.	Item	Specification	Testing(GB/T 14579)
1	Climatic Category	40/100/56	
	Rated Temperature	85˚C	
	Operating temperature range	-40˚C~+105˚C(+85˚C~+105˚C, decreasing factor 1.25% per ˚C for V_R)	
2	Rated voltage U_R	250Vac (630Vdc) - 300Vac (800Vdc) 400Vac (1 000Vdc) - 500Vac (1 600Vdc) 700Vac (2 000Vdc) - 900Vac (2 500Vdc)	
3	Capacitance	0.0010μF~0.12μF	
4	Capacitance tolerance	H(±3%), J(±5%), K(±10%), M(±20%)	Ref. item 4.2.2 1kHz, ≤3%U_R(Vrms) or 5Vrms (whichever is the smaller)
5	Tangent of the loss angle	tgδ≤0.0010	Ref.item 4.2.3 1kHz, ≤3%U_R(Vrms) or 5Vrms (whichever is the smaller)
6	Voltage Proof	There shall be no breakdown or flashover	Ref. item 4.2.1 1.6U_R，5s
7	Insulation resistance	≥50 000 MΩ	Ref. item 4.2.4 Charging voltage 100V 20˚C, measuring after applying voltage for 1 minute
8	Solderability	Good quality of tinning	Ref. item 4.5 Solder bath method Ta, method 1 Solder temperature: 245˚C ±5˚C Immersion time: 2.0s±0.5s
9	Initial measurement	Capacitance tgδ: 10kHz	
	Terminal strength	There shall be no visible damage.	Ref. item 4.3 Tension: 10N Bend: 5N The terminals shall be bent 2 times in each direction.
	Resistance to soldering heat	There shall be no visible damage and the marking shall be legible	Ref. item 4.4 Solder bath method Tb, method 1A 260˚C ±5˚C, 10s±1s
	Final measurement	ΔC/C ≤±2%(relative to the initial value) Increase of tgδ: ≤0.002 (10kHz)	

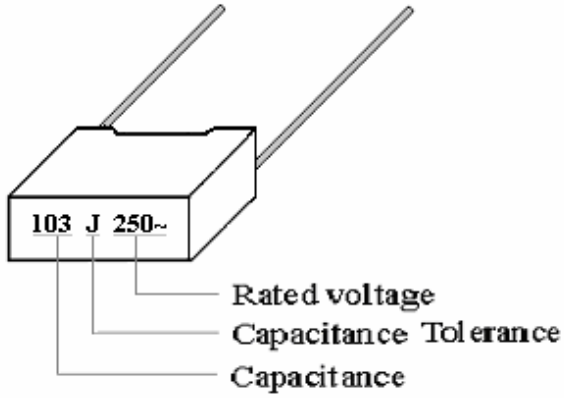
Table 2(continued)　Specification (MMKP84)

NO.	Item		Specification	Testing(GB/T 14579)
10	Initial measurement		Capacitance tgδ: 10kHz	
	Rapid change of temperature		There shall be no visible damage	Ref. item 4.6 θ_A=- 40˚C, θ_B=+105˚C 5 cycles, Duration: t=30min
	Vibration		There shall be no visible damage.	Ref. item 4.7 Amplitude 0.75mm or acceleration 98 m/s^2 (whichever is the smaller severity), f: 10Hz~500Hz.Three directions 2h for each direction, total 6h.
	Bump		There shall be no visible damage.	Ref. item 4.8 4 000 times, Acceleration:390m/s^2, Pulse duration: 6ms
	Final measurement		ΔC/C ≤±2%(relative to the initial value) Increase of tgδ: ≤0.002 (10kHz) I.R.: ≥ 50% of the rated value (No.7)	
11	climate sequence	Initial measurement	Capacitance tgδ: 10kHz	
		Dry heat		Ref. item 4.10.2 +85˚C, 16h
		Damp heat, cyclic		Ref. item 4.10.3 Test Db, Severity b, the first cycle
		Cold		Ref. item 4.10.4 -40˚C, 2h
		Low air pressure	There shall be no permanent breakdown, flashover or other harmful deformation when applying U_R in the last 5 minute	Ref. item 4.10.5 15˚C ~35˚C, 8.5kPa, 1h
		Damp heat, cyclic	Applying U_R for 1 minute after the test finished	Ref. item 4.10.6 Test Db, Severity b, the other cycles
		Final measurement	There shall be no visible damage.and the marking shall be legible ΔC/C≤ ±3%(relative to the initial value) Increase of tgδ: ≤0.002(10kHz) I.R.: ≥50% of the rated value(No.7)	

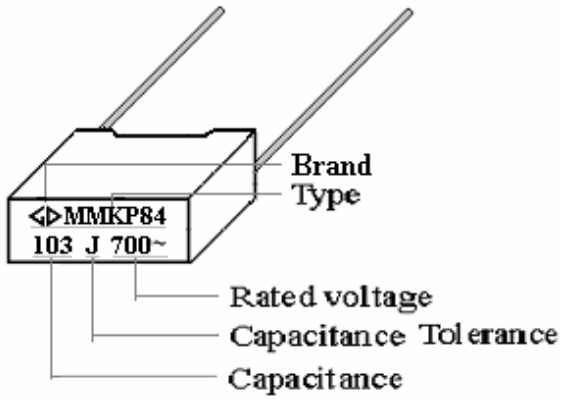
Table 2(continued)　Specification (MMKP84)

NO.	Item	Specification	Testing（GB/T 14579）
12	Damp heat Steady state	There shall be no visible damage and the marking shall be legible. ΔC/C ≤ ±3%(relative to the initial value) Increase of tgδ(1kHz) tgδ≤0.001 IR: ≥50% of the rated value(No.7)	Ref. item 4.11 Temperature:40˚C ±2˚C Hummidity:93^{+2}_{-3}%RH Duration: 21 days
13	Endurance	There shall be no visible damage and the marking shall be legible ΔC/C ≤ ±5%(relative to the initial value) Increase of tgδ: ≤0.0015(10kHz) I.R.: ≥50% of the rated value(No.7)	Ref. item 4.12.1 +105˚C,1 000h $1.25U_R$(50Hz)
14	Temperature characteristic	Measuring capacitance at test point, b, d, f. At lower category temperature -40˚C: $0\leq(C_b-C_d)/C_d\leq3\%$ At upper category temperature +85˚C: $-3.25\%\leq(C_f-C_d)/C_d\leq0$ Measuring insulation resistance at point: f I.R. ≥4 000MΩ	Ref. Item 4.2.6 Static method: The Capacitors should be kept at the following temperature in turn: a(20±2) ˚C b(–40±3) ˚C d(20±2) ˚C f(85±2) ˚C g(20±2) ˚C
15	Charging and discharging	ΔC/C ≤ ±3%(relative to the initial value) Increase of tgδ: ≤0.003 (10kHz) I.R.: ≥50% of the rated value(No.7)	Ref. item 4.13 Times: 10 000 Duration of charging: 0.5s Duration of discharging: 0.5s Charging voltage: rated DC voltage Charging resistance: $220/C_R$(Ω) Discharging resistance: $R=10/C_R$(Ω) or 20Ω(whichever is the greater) C_R: rated capacitance (μF)
16	Passive flammability	The flaming time of each capacitor shall not go beyond 30s after it is taken apart from the flame Drop of each capacitor caused by flame shall not fire the tissue below	IEC 695-2-2 Needle flame test The category of passive flammability: C Expose time in flame : 1 time Capacitor volume　Exposing time $V\leq250mm^3$　5s $250mm^3<V\leq500mm^3$　10s $500mm^3<V\leq1750mm^3$　20s $>1750mm^3$　30s

6 marking:



P≤10mm



P>10mm

7 Packing and shipment:

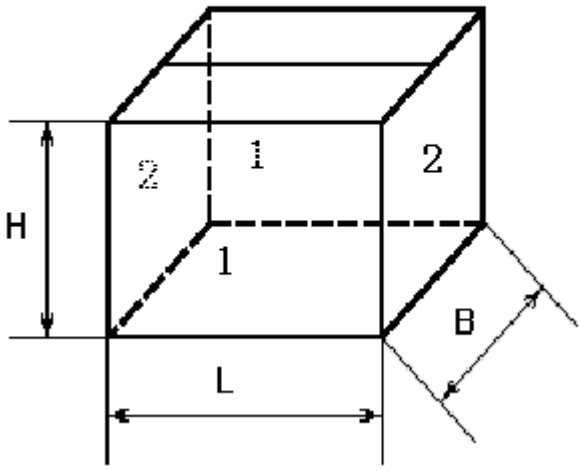
7.1 A certain quantity of capacitors and the qualified bill shall be packed with a plastic bag . Then put several plastic bags into one small packing box, sealed with adhesive paper. One big packing box contains four small packing box. Packing with small or big box depends on the customer's purchase quantity.

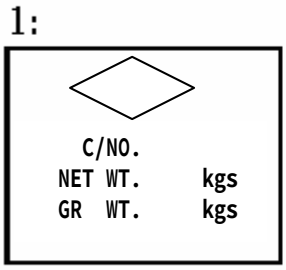
7.2 The dimensions of packing boxes refer to the drawing in the next page.

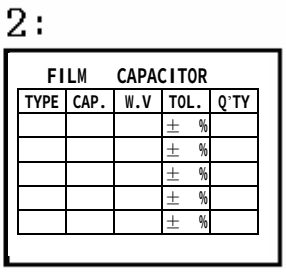
7.3 For the packing box with capacitors, all kinds of shipments are permitted. But the sprinkle of rain or snow and mechanical damage must be avoided.

Big packing box dimension drawing

L: 377mm B: 377mm H: 267mm

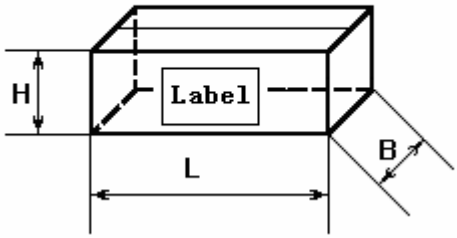




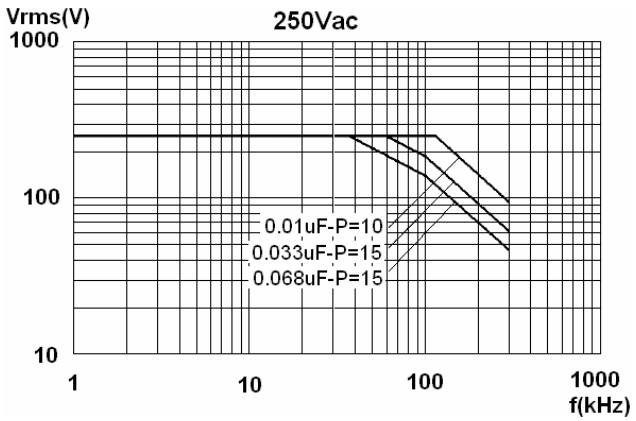


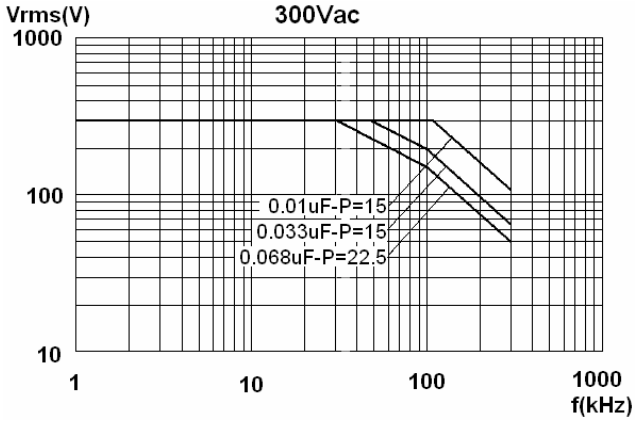
Small packing box dimension drawing:

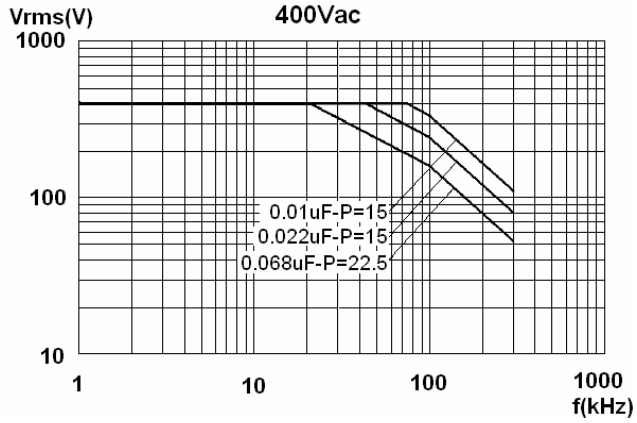
L: 353mm B: 175mm H: 118mm

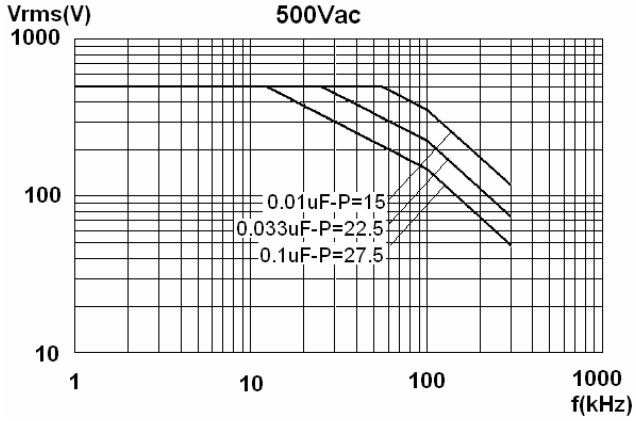


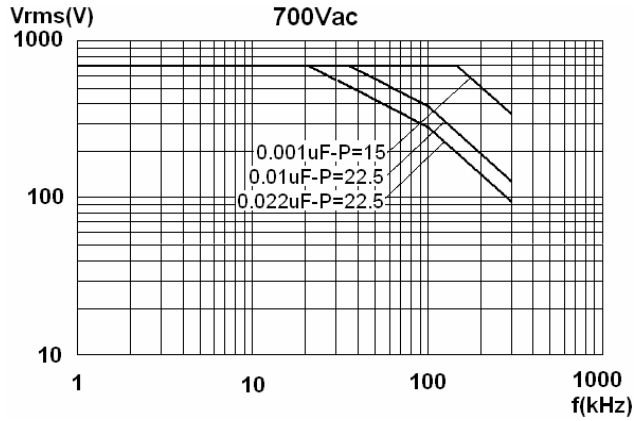
MAX. VOLTAGE (Vr.m.s.) VERSUS FREQUENCY

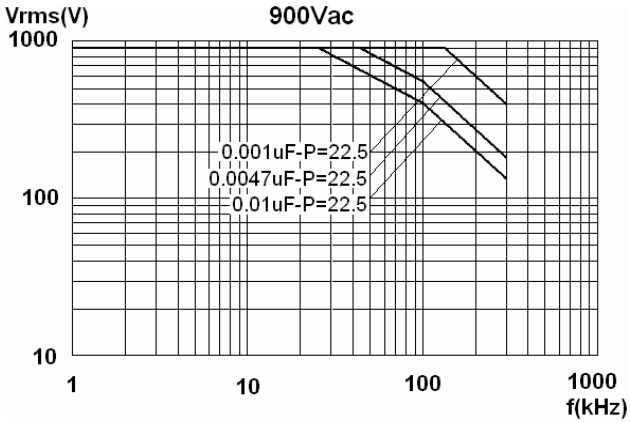












Note: P(pitch) in mm