



# FHX SERIES

85°C, Miniature, PCB mounting

## Features

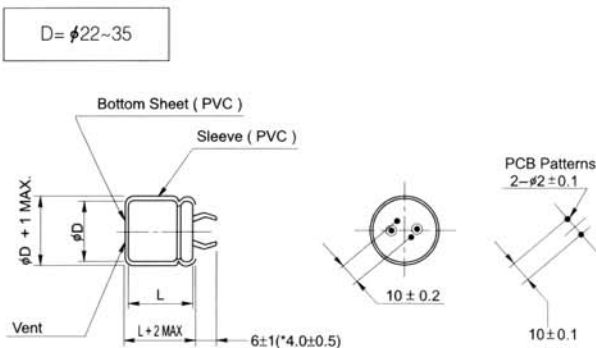
- PCB Mounting, Low profile
- Very compact size (Smaller than FHS)
- High CV density
- Load life of 2000 hours at 85°C



## Specifications

Item	Performance Characteristics		
<b>Operating temperature range</b>	160V ~ 250V : -40°C ~ +85°C, 315 ~ 450V : -25°C ~ +85°C		
<b>Rated working voltage range</b>	160V ~ 450V		
<b>Nominal capacitance range</b>	56µF ~ 2700µF, ±20% (at 20°C, 120Hz)		
<b>D.C Leakage current (at 20°C)</b>	The following specifications shall be satisfied when the rated voltage is applied for the required time. $I \leq 0.02CV$ or 2mA (5 min), whichever is less. Where I = Leakage current (µA)    C = Nominal capacitance (µF)    V = Rated voltage (V)		
<b>Tan δ (max., at 20°C, 120Hz)</b>	W.V (V)	160~250	315~450
	Tan δ	0.15	0.20
<b>Characteristics at low temperature (max.) (impedance ratio at 120Hz)</b>	W.V (V)	160~250	315~450
	Z -25°C / Z 20°C	4	8
	Z -40°C / Z 20°C	12	—
<b>Load life</b>	After applying rated working voltage for 2000 hours at +85°C and then being stabilized at +20°C, capacitors shall meet following limits.		
	Capacitance change	Within ± 20% of the initial measured value	
	Tan δ	≤ 200% of the initial specified value	
	Leakage current	≤ The initial specified value	
<b>Shelf life</b>	After storage for 1000 hours at +85°C with no voltage applied and then being stabilized at +20°C, capacitors shall meet following limits.		
	Capacitance change	Within ± 15% of the initial measured value	
	Tan δ	≤ 150% of the initial specified value	
	Leakage current	≤ The initial specified value	

## Dimensions



\* Shorter terminal is available upon request

## Ripple current coefficient

• Frequency

W.V (V) \ Freq (Hz)	50	120	500	1K	10K	100K
160~250	0.82	1.0	1.20	1.37	1.45	1.50
315~450	0.82	1.0	1.18	1.23	1.35	1.40

• Temperature

Temperature	≤45°C	60°C	70°C	85°C
Factor	1.45	1.30	1.15	1.0



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## Standard Ratings of FHX Series

W.V(V) Cap(μF)	160(2C)				180(2S)				200(2D)				250(2E)			
	φ22	φ25	φ30	φ35	φ22	φ25	φ30	φ35	φ22	φ25	φ30	φ35	φ22	φ25	φ30	φ35
180													22x25			
													1.00			
220													22x25			
													1.10			
270									22x25				22x30	25x25		
									1.25				1.28	1.30		
330					22x25				22x30	25x25			22x35	25x30		
					1.25				1.45	1.45			1.48	1.48		
390	22x25				22x30				22x30	25x25			22x40	25x30	30x25	
	1.35				1.50				1.60	1.60			1.70	1.70	1.68	
470	22x30	25x25			22x35	25x25			22x35	25x30			22x45	25x35	30x30	
	1.65	1.68			1.75	1.75			1.85	1.85			1.95	1.95	1.98	
560	22x35	25x30	30x25		22x40	25x30	30x25		22x40	25x35	30x25			25x40	30x30	35x25
	1.95	1.95	1.95		2.00	2.00	2.05		2.00	2.05	2.05			2.15	2.10	2.15
680	22x40	25x30	30x25		22x45	25x35	30x25		22x45	25x40	30x30			25x45	30x35	35x30
	2.15	2.15	2.15		2.25	2.25	2.20		2.30	2.35	2.30			2.45	2.45	2.45
820	22x45	25x35	30x30		22x50	25x40	30x30	35x25	22x50	25x45	30x35	35x25			30x40	35x35
	2.52	2.50	2.52		2.65	2.65	2.60	2.60	2.65	2.70	2.70	2.65			2.75	2.75
1000	22x50	25x40	30x35	35x25		25x45	30x35	35x30		25x50	30x40	35x30			30x45	35x40
	2.80	2.80	2.82	2.82		2.95	2.95	2.95		3.02	3.02	3.00			3.30	3.30
1200		25x45	30x35	35x30		25x50	30x40	35x30			30x45	35x35				35x45
		3.20	3.25	3.25		3.30	3.35	3.35			3.45	3.45				3.50
1500			30x40	35x35			30x45	35x35			30x50	35x40				35x50
			3.65	3.70			3.80	3.80			3.90	3.90				4.00
1800			30x50	35x40				35x45				35x45				
			4.20	4.20				4.25				4.45				
2200				35x45				35x50				35x50				
				4.75				4.90				4.95				
2700				35x50												
				5.40												

W.V(V) Cap(μF)	315(2F)				350(2V)				400(2G)				450(2W)			
	φ22	φ25	φ30	φ35	φ22	φ25	φ30	φ35	φ22	φ25	φ30	φ35	φ22	φ25	φ30	φ35
56													22x25			
													0.56			
68													22x30			
													0.62			
82									22x25				22x30	25x25		
									0.65				0.72	0.72		
100					22x25				22x30	25x25			22x35	25x30	30x25	
					0.70				0.80	0.80			0.83	0.83	0.83	
120	22x25				22x30	25x25			22x30	25x25			22x40	25x30	30x25	
	0.75				0.85	0.85			1.03	1.03			1.05	1.05	1.05	
150	22x30	25x25			22x35	25x25			22x35	25x30	30x25		22x45	25x35	30x30	
	0.95	0.95			1.00	1.00			1.10	1.10	1.10		1.12	1.10	1.12	
180	22x30	25x25			22x35	25x30	30x25		22x40	25x35	30x25			25x40	30x35	
	1.05	1.05			1.15	1.15	1.15		1.20	1.20	1.20			1.24	1.22	
220	22x35	25x30	30x25		22x40	25x35	30x30		22x45	25x40	30x30			25x50	30x40	35x30
	1.18	1.18	1.20		1.30	1.30	1.30		1.35	1.33	1.35			1.40	1.40	1.38
270	22x40	25x35	30x25		22x50	25x40	30x30			25x45	30x35	35x30			30x45	35x35
	1.40	1.40	1.35		1.55	1.55	1.55			1.58	1.55	1.58			1.68	1.68
330	22x45	25x40	30x30			25x45	30x35	35x30		25x50	30x40	35x30			30x50	35x40
	1.55	1.55	1.60			1.70	1.70	1.70		1.76	1.76	1.75			1.90	1.90
390		25x45	30x35			25x50	30x40	35x35			30x45	35x35				35x45
		1.80	1.80			1.95	1.95	1.95			2.00	2.00				2.10
470		25x50	30x40	35x30			30x45	35x35			30x50	35x40				35x50
		2.05	2.05	2.05			2.30	2.30			2.32	2.32				2.40
560			30x45	35x35			30x50	35x40				35x45				
			2.35	2.35			2.55	2.55				2.60				
680				35x40				35x45				35x50				
				2.50				2.80				2.90				
820				35x45												
				3.00												
1000				35x50												
				3.15												

Max. permissible ripple current [A(rms) at 85°C, 120Hz]  
Case size [φ DxL(mm)]

High Power

# ORDERING INFORMATION (CEL)

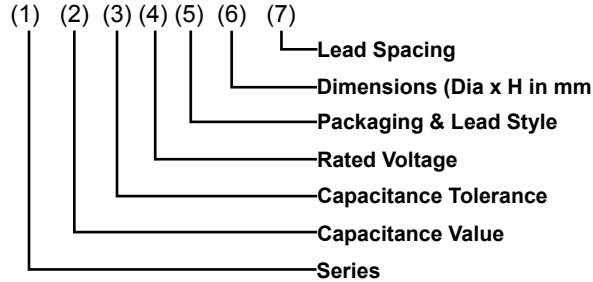


DAEWOO / PARTSNIC

## Through-Hole Part Numbering System Example:

**CEL** = Leaded Type, **RM** = Leaded Radial 85°C Miniature Series, **102** = 1000µF, **M** =20% Tolerance, **1E** 25 Volts, **B** = Bulk,  
**1020** = Case size (Dia x H) = 10.0 x 20.0mm, **E** = 5.0mm

### RM 102 M 1E B 1020 E



#### (1) Series

See Quick Guide on page 2  
Example: RSS, RM, RMU,...

#### (2) Capacitance Value Code

Capacitance expressed in micro Farads (µF)  
First two digits are significant figures  
Third digit denotes the number of zeros  
Use R for decimal point for values less than 10µF

#### Examples:

CODE	Capacitance
R10	0.1 µF
R68	0.68 µF
1R0	1.0 µF
100	10 µF
680	68 µF
471	470 µF
102	1000 µF
103	10000 µF

#### (3) Capacitance Tolerance Code

CODE	Cap. Tol.	CODE	Cap. Tol.
J	±5%	V	-10% ~ +20%
K	±10%	Q	-10% ~ +30%
M	±20%	T	-10% ~ +50%
R	+20%, -0%		

#### (4) Rated Voltage Code

CODE	Voltage	CODE	Voltage
0G	4.0V	2C	160V
0J	6.3V	2S	180V
1A	10V	2D	200V
1C	16V	2E	250V
1E	25V	2F	315V
1V	35V	2V	350V
1H	50V	2G	400V
1J	63V	2W	450V
1K	80V	3Z	1000V
2A	100V		

#### (5) Packaging Form & Lead Style Code ( see page 7, 8, 9 for details)

	Code	Packaging Form & Lead Style
<b>Bulk</b>	<b>B</b>	Bulk: Standard Package
	<b>L</b>	"FL" Bulk: 4 -8ø Long Leads Formed to 5 mm Pitch
<b>Snap-In</b>	<b>1</b>	"SA/S1A": 10-13ø Snap-in Cut 5.0mm
	<b>2</b>	"SB/SB1": 16-13ø Snap-in Cut 5.0mm
	<b>3</b>	"SC/S2A": 10-13ø Snap-in Cut 4.5mm
	<b>4</b>	"SE/S2B": 16-18ø Snap-in Cut 4.5mm
	<b>5</b>	"SG/S3A": 4-8ø Snap-in Cut 7.5mm
<b>Form</b>	<b>F</b>	"FF/FCF": 4-8ø Forming Cut 6.5mm
<b>Straight Cut</b>	<b>C</b>	"CJ": 4-18ø Straight Cut 4.0mm
	<b>6</b>	"CR": 4-18ø Straight Cut 3.5mm
	<b>7</b>	"CS": 4-18ø Straight Cut 5.0mm
	<b>8</b>	"CE": 4-18ø Straight Cut 6.35mm
<b>Ammo Tape (+) Leading</b>	<b>A</b>	"TS"/"TSSA": 4-8ø Straight Ammo Detail Ranges: 4-6.3ø; F=2.5mm 8ø; F=3.5mm
		"T5/TAA": 4-8ø Form Tape & Ammo 5mm Pitch
		"T7/TSAA": 10ø Straight Ammo Tape 5mm Pitch
		"T9/TSAA": 13ø Straight Ammo Tape 5mm Pitch
		"TB/TSAA": 16-18ø Straight Ammo Tape 5mm Pitch
<b>Tape &amp; Reel (+) Leading</b>	<b>T</b>	"TQ/TSSRA": 4-8ø Straight Ammo Detail Ranges: 4-6.3ø; F=2.5mm 8ø; F=3.5mm
		"T1/TRA": 4-13ø Form Tape & Reel 5mm Pitch
		"T3/TSRA": 10-13ø Straight Reel Tape 5mm Pitch

NOTE: Standard Pack Anode(+) Lead Leading FEEDS OFF FIRST  
Special Option Cathode(-) Lead Leading available upon request  
Standard Packages: B = Bulk, A = Ammo, T = Tape & Reel

#### (6) Dimension Code (Diameter x Height in mm)

Size Code	Diameter	Height	Size Code	Diameter	Height
0407	4	7	1835	18	35.5
0507	5	7	2240	22	40
0607	6.3	7	2545	25	45
0511	5	11	3035	30	35
0611	6.3	11	3500	35	100
0811	8	11	3501	35	110
1012	10	12.5	5102	51	120
1220	12.5	20	6303	63.5	130
1320	13	20	7604	76	140
1631	16	31.5	8904	89	140

#### (7) Lead Spacing Code (LS)

Code	X	A	B	C	D	E	J	F
LS	1.0	1.5	2.0	2.5	3.5	5.0	7.0	7.5
Code	K	M	G	P	H	Q	R	S
LS	8.0	10.0	10.5	12.0	12.5	12.8	15.0	16.0
Code	T	U	V	W	Y	Z		
LS	20.0	21.7	28.3	30.0	31.6	32		