



# FHD SERIES

85°C, Sub-miniature, 20mm Height

## Features

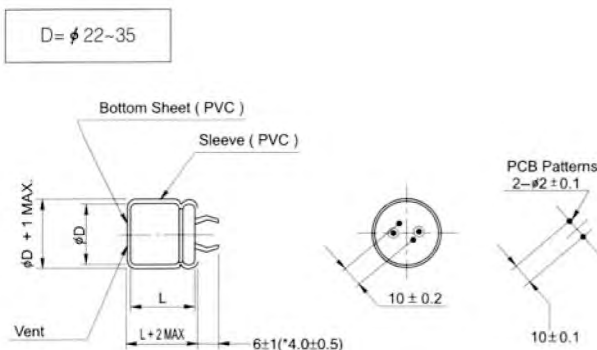
- Lengths are all 20mm, Down size
- PCB mounting
- High CV density
- Load life of 2000 hours at 85°C



## Specifications

Item	Performance Characteristics		
<b>Operating temperature range</b>	160V~250V: -40°C~ +85°C, 400V: -25°C~+85°C		
<b>Rated working voltage range</b>	160V ~ 400V		
<b>Nominal capacitance range</b>	47 $\mu$ F ~ 560 $\mu$ F, $\pm$ 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( $\mu$ A) C=Nominal capacitance( $\mu$ F) V=Rated voltage(V)		
<b>Tan <math>\delta</math> (max., at 20°C, 120Hz)</b>	W.V(V)	160~250	350~400
	Tan $\delta$	0.10	0.20
<b>Characteristics at low temperature(max.) (impedance ratio at 120Hz)</b>	W.V(V)	160~250	350~400
	Z-25°C/+20°C	4	8
	Z-40°C/+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 $\pm$ 20% of the initial measured value	
	Tan $\delta$	$\leq \pm$ 200% of the initial specified value	
	Leakage current	$\leq$ The initial specified value	
<b>Shelf life</b>	After storage for 1000 hours at + 105°C with no voltage applied and then being stabilized at +20°C, capacitors shall meet following limits.		
	Capacitance change	Within $\pm$ 15% of the initial measured value	
	Tan $\delta$	$\leq$ 150% of the initial specified value	
	Leakage current	$\leq$ The initial specified value	

## Dimensions



## Ripple current coefficient

### Frequency

W.V(V)	Freq(Hz)					
	50	120	500	1K	10K	100K
<b>160~250</b>	0.82	1.0	1.20	1.37	1.45	1.50
<b>350~450</b>	0.82	1.0	1.18	1.23	1.35	1.40

### Temperature

Temperature	$\leq$ 45°C	60°C	70°C	85°C
<b>Factor</b>	1.45	1.30	1.15	1.0

\* Shorter terminal is available upon request



# FHD SERIES

## Standard Ratings of FHD Series

 $\phi D \times L$  (mm)

Cap( $\mu F$ )	W.V(V)	160(2C)		200(2D)		250(2E)	
		SIZE	$I_r$	SIZE	$I_r$	SIZE	$I_r$
100						22x20	0.65
150				22x20	0.75	30x20	0.87
220		22x20	0.85	25x20	0.95	30x20	1.10
270		25x20	1.10	30x20	1.25	35x20	1.28
330		30x20	1.20	30x20	1.40	35x20	1.45
390		30x20	1.35	35x20	1.60		
470		35x20	1.50	35x20	1.80		
560		35x20					

Cap( $\mu F$ )	W.V(V)	350(2V)		400(2G)	
		SIZE	$I_r$	SIZE	$I_r$
47				22x20	0.35
56				25x20	0.40
68				25x20	0.46
82				25x20	0.60
100		25x20	0.70	30x20	0.72
120		25x20	0.75	35x20	0.80
150		30x20	0.80	35x20	0.86
180		35x20	0.87	35x20	0.92

 $I_r$ : Maximum Permissible Ripple Current[A(rms) at 85°C, 120Hz]

# ORDERING INFORMATION for Leaded Type



Daewoo Components Corp.

## Through-Hole Part Numbering System Example:

**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



### (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
Bulk	B	Bulk: Standard Package
	L	Bulk: 4 -8ø Long Leads Formed to 5 mm Pitch
Snap-In	1	10-13ø Snap-in Cut 5.0mm
	2	16-13ø Snap-in Cut 5.0mm
	3	10-13ø Snap-in Cut 4.5mm
	4	16-18ø Snap-in Cut 4.5mm
	5	4-8ø Snap-in Cut 7.5mm
Form	F	4-8ø Forming Cut 6.5mm
	G	4-8ø Forming Cut 10.0mm
Straight Cut	C	4-18ø Straight Cut 4.0mm
	6	4-18ø Straight Cut 3.1mm
	7	4-18ø Straight Cut 5.0mm
	8	4-18ø Straight Cut 6.35mm
Ammo Tape (+) Leading	A	4-8ø Straight Ammo Detail Ranges: 4-6.3ø; F=2.5mm 8ø; F=3.5mm
		4-8ø Form Tape & Ammo 5mm Pitch
		10ø Straight Ammo Tape 5mm Pitch
		13ø Straight Ammo Tape 5mm Pitch
		16-18ø Straight Ammo Tape 5mm Pitch
Tape & Reel (+) Leading	T	4-8ø Straight Ammo Detail Ranges: 4-6.3ø; F=2.5mm 8ø; F=3.5mm
		4-13ø Form Tape & Reel 5mm Pitch
		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) Example Dimension Code (Diameter x Height in mm)

Size Code	Diameter	Height	Size Code	Diameter	Height
0405	4	5	1320	13	20
0407	4	7	1631	16	31.5
0505	5	5	1835	18	35.5
0507	5	7	2240	22	40
0607	6.3	7	2545	25	45
0511	5	11	3035	30	35
0605	6	5	3500	35	100
0611	6.3	11	3501	35	110
0805	8	5	5102	51	120
0811	8	11	6303	63.5	130
1012	10	12.5	7604	76	140
1220	12.5	20	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		