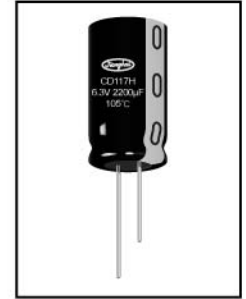
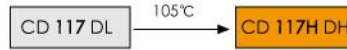


# CD 117H DH Series



2000h at 105°C

- Load life of 2000 hours at 105°C
- Low Leakage Current
- Close Tolerance

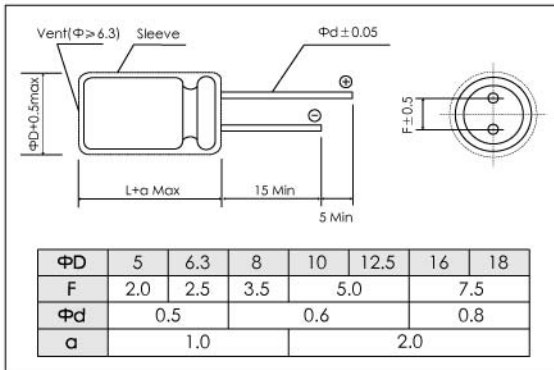


Items	Characteristics																												
Operating Temperature Range (°C)	-40 ~ +105																												
Capacitance Tolerance (20°C, 120Hz)	± 20% or ± 10%																												
Leakage Current (µA)	After 1 minute at 20°C application of rated voltage, leakage current is not more than 0.008CV or 1.0µA, whichever is greater. C: Nominal Capacitance (µF) V: Rated Voltage (V)																												
Dissipation Factor (20°C, 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Tan δ (max)</td> <td>~Φ10×12.5</td> <td>0.18</td> <td>0.15</td> <td>0.12</td> <td>0.08</td> <td>0.08</td> <td>0.08</td> <td>0.07</td> <td>0.07</td> </tr> <tr> <td>Φ10×16</td> <td>0.21</td> <td>0.17</td> <td>0.14</td> <td>0.12</td> <td>0.12</td> <td>0.1</td> <td>0.08</td> <td>0.08</td> </tr> </tbody> </table>	Rated Voltage (V)	6.3	10	16	25	35	50	63	100	Tan δ (max)	~Φ10×12.5	0.18	0.15	0.12	0.08	0.08	0.08	0.07	0.07	Φ10×16	0.21	0.17	0.14	0.12	0.12	0.1	0.08	0.08
	Rated Voltage (V)	6.3	10	16	25	35	50	63	100																				
Tan δ (max)	~Φ10×12.5	0.18	0.15	0.12	0.08	0.08	0.08	0.07	0.07																				
	Φ10×16	0.21	0.17	0.14	0.12	0.12	0.1	0.08	0.08																				
Stability at Low Temperature (Impedance Ratio at 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Impedance ratio</td> <td>Z<sub>-25°C</sub> / Z<sub>+20°C</sub></td> <td>4</td> <td>3</td> <td>2</td> <td colspan="3">1.5</td> <td></td> </tr> <tr> <td>Z<sub>-40°C</sub> / Z<sub>+20°C</sub></td> <td>8</td> <td>6</td> <td colspan="2">4</td> <td colspan="3">3</td> </tr> </tbody> </table>	Rated Voltage (V)	6.3	10	16	25	35	50	63	100	Impedance ratio	Z <sub>-25°C</sub> / Z <sub>+20°C</sub>	4	3	2	1.5				Z <sub>-40°C</sub> / Z <sub>+20°C</sub>	8	6	4		3				
	Rated Voltage (V)	6.3	10	16	25	35	50	63	100																				
Impedance ratio	Z <sub>-25°C</sub> / Z <sub>+20°C</sub>	4	3	2	1.5																								
	Z <sub>-40°C</sub> / Z <sub>+20°C</sub>	8	6	4		3																							

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	3000h	20000h	2000h	2000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 15% of initial value	Within ± 15% of initial value	Within ± 15% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 150% of specified value	Not more than 150% of specified value	Not more than 150% of specified value
Condition: Applied Voltage Applied Current Applied Temperature Failure Rate Level	U <sub>R</sub> I <sub>R</sub> 105°C ≤ 1% Failure Rate	U <sub>R</sub> 1.2 x I <sub>R</sub> 40°C ≤ 1% Failure Rate	U <sub>R</sub> I <sub>R</sub> 105°C guaranteed	U <sub>R</sub> I <sub>R</sub> = 0 105°C	U <sub>R</sub> = 0 I <sub>R</sub> = 0 105°C After test: U <sub>R</sub> to be applied for 30min >24h before measurement

## Dimensions

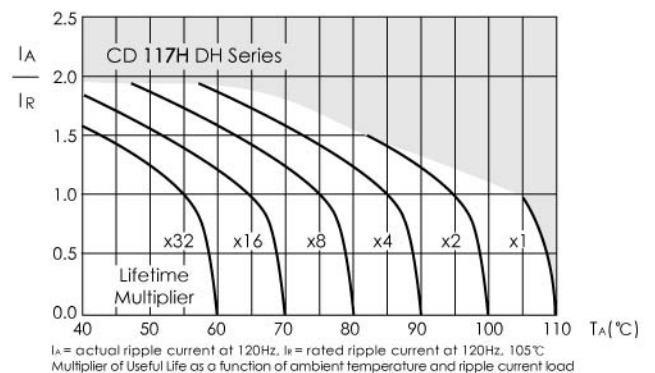
mm



## Frequency Coefficient

Frequency Cap (µF)	Frequency			
	50~60Hz	120Hz	1kHz	≥ 10kHz
~ 68	0.75	1.00	1.57	2.10
100 ~ 680	0.80	1.00	1.34	1.50
1000 ~ 10000	0.85	1.00	1.13	1.15

## Lifetime Diagram



## Temperature Coefficient

Temperature(°C)	+70	+85	+105
Coefficient	1.80	1.40	1.00

MINIATURE



## Ratings for CD 117H DH Series

Ur (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size $\Phi$ D x L	P/N
(V)	( $\mu$ F)	( $\Omega$ )	(mArms)	(mm)	-
6.3 (7.2) 0J	470	0.51	390	10 x 12.5	ECR0JDH471M□□100012
	680	0.41	480	10 x 16	ECR0JDH681M□□100016
	1000	0.28	650	10 x 20	ECR0JDH102M□□100020
	1500	0.19	910	12.5 x 25	ECR0JDH152M□□125025
	2200	0.13	1060	12.5 x 25	ECR0JDH222M□□125025
	3300	0.08	1270	16 x 25	ECR0JDH332M□□160025
	4700	0.06	1500	16 x 31.5	ECR0JDH472M□□160031
	6800	0.04	1760	18 x 35.5	ECR0JDH682M□□180035
	10000	0.03	1900	18 x 40	ECR0JDH103M□□180040
10 (13) 1A	47	4.23	110	5 x 11.5	ECR1ADH470M□□050011
	68	2.93	150	6.3 x 11.5	ECR1ADH680M□□063011
	100	1.99	180	6.3 x 11.5	ECR1ADH101M□□063011
	150	1.33	250	8 x 11.5	ECR1ADH151M□□080011
	220	0.90	310	8 x 11.5	ECR1ADH221M□□080011
	330	0.60	400	10 x 12.5	ECR1ADH331M□□100012
	470	0.48	530	10 x 16	ECR1ADH471M□□100016
	680	0.33	600	10 x 20	ECR1ADH681M□□100020
	1000	0.23	810	12.5 x 20	ECR1ADH102M□□125020
	1500	0.15	1020	12.5 x 25	ECR1ADH152M□□125025
	2200	0.10	1200	16 x 25	ECR1ADH222M□□160025
	3300	0.07	1420	16 x 31.5	ECR1ADH332M□□160031
	4700	0.05	1650	16 x 35.5	ECR1ADH472M□□160035
6800	0.03	1890	18 x 35.5	ECR1ADH682M□□180035	
16 (20) 1C	10	15.92	55	5 x 11.5	ECR1CDH100M□□050011
	15	10.62	70	5 x 11.5	ECR1CDH150M□□050011
	22	7.24	85	5 x 11.5	ECR1CDH220M□□050011
	33	4.83	100	5 x 11.5	ECR1CDH330M□□050011
	47	3.39	140	6.3 x 11.5	ECR1CDH470M□□063011
	68	2.34	160	6.3 x 11.5	ECR1CDH680M□□063011
	100	1.59	230	8 x 11.5	ECR1CDH101M□□080011
	150	1.06	280	8 x 11.5	ECR1CDH151M□□080011
	220	0.72	370	10 x 12.5	ECR1CDH221M□□100012
	330	0.56	420	10 x 16	ECR1CDH331M□□100016
	470	0.40	550	10 x 20	ECR1CDH471M□□100020
	680	0.27	730	12.5 x 20	ECR1CDH681M□□125020
	1000	0.19	910	12.5 x 25	ECR1CDH102M□□125025
	1500	0.12	1150	16 x 25	ECR1CDH152M□□160025
	2200	0.08	1300	16 x 25	ECR1CDH222M□□160025
	3300	0.06	1550	16 x 35.5	ECR1CDH332M□□160035
4700	0.04	1820	16 x 35.5	ECR1CDH472M□□160035	
25 (32) 1E	4.7	22.59	45	5 x 11.5	ECR1EDH47M□□050011
	6.8	15.61	55	5 x 11.5	ECR1EDH68M□□050011
	10	10.62	70	5 x 11.5	ECR1EDH100M□□050011
	15	7.08	85	5 x 11.5	ECR1EDH150M□□050011
	22	4.83	100	5 x 11.5	ECR1EDH220M□□050011
	33	3.22	140	6.3 x 11.5	ECR1EDH330M□□063011
	47	2.26	170	6.3 x 11.5	ECR1EDH470M□□063011
	68	1.56	230	8 x 11.5	ECR1EDH680M□□080011
	100	1.06	280	8 x 11.5	ECR1EDH101M□□080011
	150	0.71	370	10 x 12.5	ECR1EDH151M□□100012
	220	0.72	400	10 x 16	ECR1EDH221M□□100016
	330	0.48	490	10 x 20	ECR1EDH331M□□100020
	470	0.34	600	12.5 x 20	ECR1EDH471M□□125020
	680	0.23	810	12.5 x 25	ECR1EDH681M□□125025
	1000	0.16	1010	16 x 25	ECR1EDH102M□□160025
	1500	0.11	1270	16 x 31.5	ECR1EDH152M□□160031
2200	0.07	1440	16 x 35.5	ECR1EDH222M□□160035	
3300	0.05	1720	18 x 40	ECR1EDH332M□□180040	
35 (44) 1V	15	7.08	85	5 x 11.5	ECR1VDH150M□□050011
	22	4.83	110	6.3 x 11.5	ECR1VDH220M□□063011
	33	3.22	140	6.3 x 11.5	ECR1VDH330M□□063011
	47	2.26	190	8 x 11.5	ECR1VDH470M□□080011
	68	1.56	230	8 x 11.5	ECR1VDH680M□□080011
	100	1.06	300	10 x 12.5	ECR1VDH101M□□100012
	150	1.06	400	10 x 16	ECR1VDH151M□□100016
	220	0.72	440	10 x 20	ECR1VDH221M□□100020
	330	0.48	550	12.5 x 20	ECR1VDH331M□□125020
	470	0.34	680	12.5 x 25	ECR1VDH471M□□125025
	680	0.23	840	16 x 25	ECR1VDH681M□□160025
	1000	0.16	1100	16 x 25	ECR1VDH102M□□160025
	1500	0.11	1390	16 x 35.5	ECR1VDH152M□□160035
	2200	0.07	1580	16 x 35.5	ECR1VDH222M□□160035

Ur (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size $\Phi$ D x L	P/N	
(V)	( $\mu$ F)	( $\Omega$ )	(mArms)	(mm)	-	
50 (63) 1H	0.1	1061.57	1.1	5 x 11.5	ECR1HDH0R1M□□050011	
	0.15	707.71	1.6	5 x 11.5	ECR1HDH15M□□050011	
	0.22	482.53	2.3	5 x 11.5	ECR1HDH22M□□050011	
	0.33	321.69	3.5	5 x 11.5	ECR1HDH33M□□050011	
	0.47	225.87	5.0	5 x 11.5	ECR1HDH47M□□050011	
	0.68	156.11	7.3	5 x 11.5	ECR1HDH68M□□050011	
	1	106.16	10.7	5 x 11.5	ECR1HDH101M□□050011	
	1.5	70.77	16	5 x 11.5	ECR1HDH15M□□050011	
	2.2	48.25	23	5 x 11.5	ECR1HDH22M□□050011	
	3.3	32.17	40	5 x 11.5	ECR1HDH33M□□050011	
	4.7	22.59	45	5 x 11.5	ECR1HDH47M□□050011	
	6.8	15.61	55	5 x 11.5	ECR1HDH68M□□050011	
	10	10.62	70	5 x 11.5	ECR1HDH100M□□050011	
	15	7.08	95	6.3 x 11.5	ECR1HDH150M□□063011	
	22	4.83	110	6.3 x 11.5	ECR1HDH220M□□063011	
	33	3.22	165	8 x 11.5	ECR1HDH330M□□080011	
	47	2.26	190	8 x 11.5	ECR1HDH470M□□080011	
	68	1.56	250	10 x 12.5	ECR1HDH680M□□100012	
	100	1.33	320	10 x 16	ECR1HDH101M□□100016	
150	0.88	420	10 x 20	ECR1HDH151M□□100020		
220	0.60	490	12.5 x 20	ECR1HDH221M□□125020		
330	0.40	600	12.5 x 20	ECR1HDH331M□□125020		
470	0.28	760	16 x 25	ECR1HDH471M□□160025		
680	0.20	910	16 x 25	ECR1HDH681M□□160025		
1000	0.13	1140	16 x 31.5	ECR1HDH102M□□160031		
1500	0.09	1480	18 x 40	ECR1HDH152M□□180040		
63 (79) 1J	6.8	13.66	59	5 x 11.5	ECR1JDH68M□□050011	
	10	9.29	75	6.3 x 11.5	ECR1JDH100M□□063011	
	15	6.19	100	6.3 x 11.5	ECR1JDH150M□□063011	
	22	4.22	115	8 x 11.5	ECR1JDH220M□□080011	
	33	2.81	170	8 x 11.5	ECR1JDH330M□□080011	
	47	1.98	200	10 x 12.5	ECR1JDH470M□□100012	
	68	1.56	270	10 x 16	ECR1JDH680M□□100016	
	100	1.06	330	10 x 20	ECR1JDH101M□□100020	
	150	0.71	450	12.5 x 20	ECR1JDH151M□□125020	
	220	0.48	550	12.5 x 20	ECR1JDH221M□□125020	
	330	0.32	710	12.5 x 25	ECR1JDH331M□□125025	
	470	0.23	850	16 x 25	ECR1JDH471M□□160025	
	680	0.16	1050	16 x 31.5	ECR1JDH681M□□160031	
	1000	0.11	1330	18 x 35.5	ECR1JDH102M□□180035	
	100 (125) 2A	0.1	928.87	2.1	5 x 11.5	ECR2ADH0R1M□□050011
		0.15	619.25	3.2	5 x 11.5	ECR2ADH15M□□050011
		0.22	422.22	4.7	5 x 11.5	ECR2ADH22M□□050011
		0.33	281.48	7.0	5 x 11.5	ECR2ADH33M□□050011
		0.47	197.63	10.1	5 x 11.5	ECR2ADH47M□□050011
0.68		136.60	14.5	5 x 11.5	ECR2ADH68M□□050011	
1		92.89	19	5 x 11.5	ECR2ADH101M□□050011	
1.5		61.92	23	5 x 11.5	ECR2ADH15M□□050011	
2.2		42.22	28	5 x 11.5	ECR2ADH22M□□050011	
3.3		28.15	45	5 x 11.5	ECR2ADH33M□□050011	
4.7		19.76	50	5 x 11.5	ECR2ADH47M□□050011	
6.8		13.66	65	6.3 x 11.5	ECR2ADH68M□□063011	
10		9.29	90	8 x 11.5	ECR2ADH100M□□080011	
15		6.19	110	8 x 11.5	ECR2ADH150M□□080011	
22		4.22	136	10 x 12.5	ECR2ADH220M□□100012	
33		3.22	180	10 x 16	ECR2ADH330M□□100016	
47		2.26	220	10 x 20	ECR2ADH470M□□100020	
68		1.56	290	10 x 20	ECR2ADH680M□□100020	
100		1.06	370	12.5 x 20	ECR2ADH101M□□125020	
150		0.71	470	12.5 x 25	ECR2ADH151M□□125025	
220	0.48	580	16 x 25	ECR2ADH221M□□160025		
330	0.32	730	16 x 31.5	ECR2ADH331M□□160031		
470	0.23	910	16 x 35.5	ECR2ADH471M□□160035		

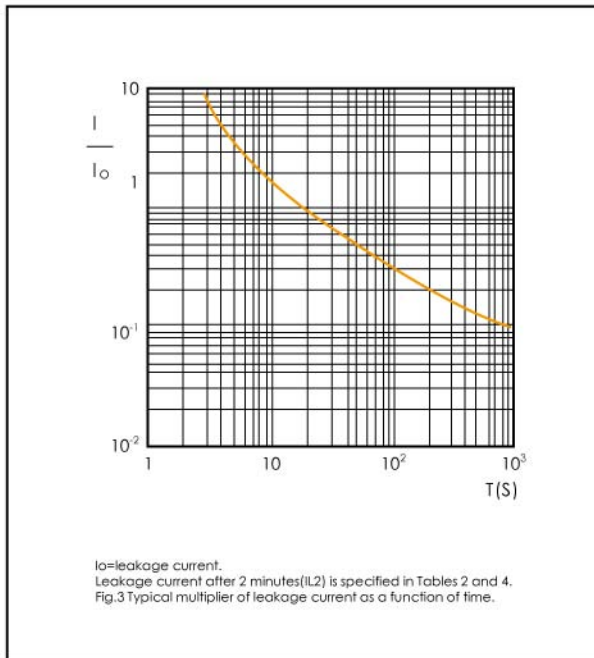
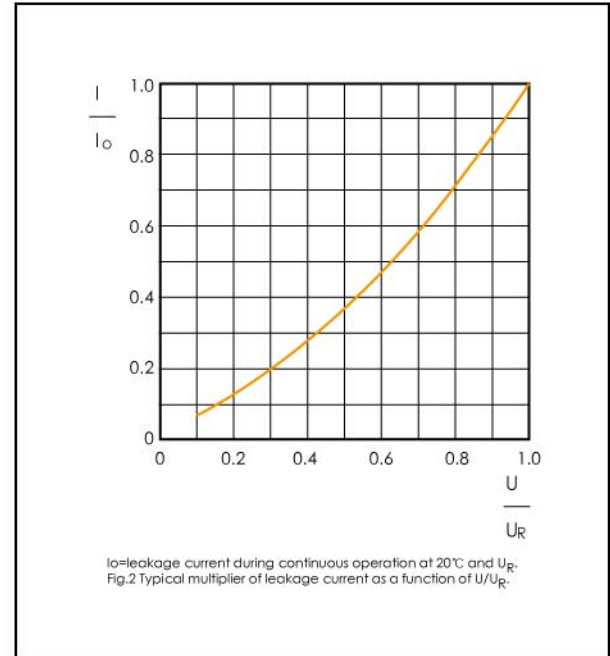
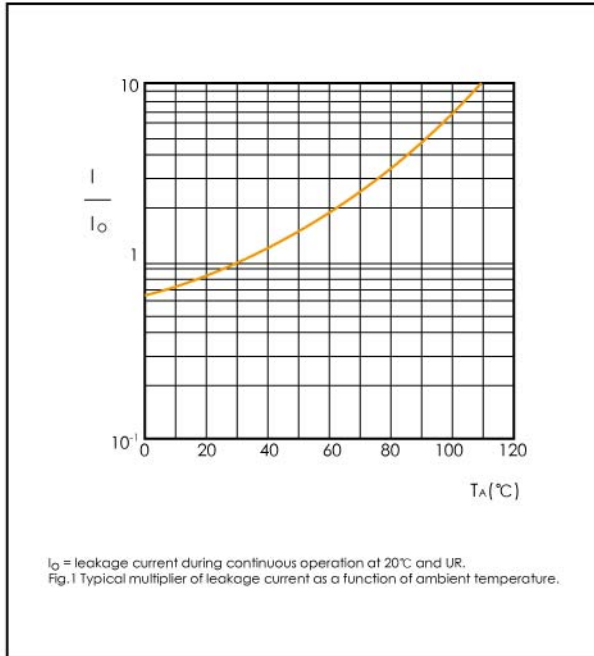
MINIATURE

Customer products are available on request.



## Ratings for CD 117H DH Series

### Typical Curves



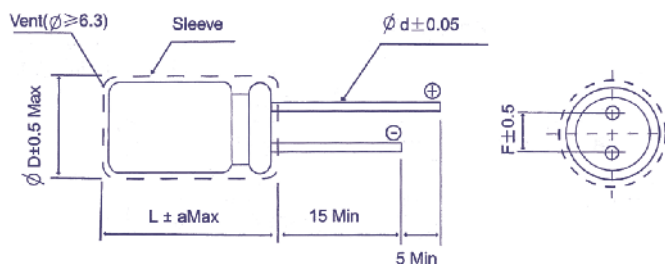
## Order Code **SMD, Radial, Snap-In**

EC	R	1C	PT	101	M	FF	25	0611	JExxxx	
Technology	Terminal Type	Rated Voltage Code	Series Code	Capacitance Code (in $\mu\text{F}$ )	Capacitance Tolerance	Lead Form	Terminal/Pitch Size	Size $\varnothing D \times L$	for Specials only	
EC = Electrolytic Capacitor	SMD = V	2,5V = 0E	CD <b>110</b> = PT	0,47 = R47	$\pm 20\%$ = M	SMD:		4x7 = 0407		
	Radial = R	4V = 0G	CD <b>11GL</b> = GL	1,0 = 010	$\pm 10\%$ = K	<b>Taped</b> = FF	Terminal = T2	5x11,5 = 0511		
PC = Polymer Capacitor	Snap-In = S	6,3V = 0J	CD <b>261</b> = LK	2,2 = 2R2	+20 / -0% = R	Radial:		6,3x11,5 = 0611		
		10V = 1A	CD <b>261X</b> = QX	10 = 100	+20 / -10% = V	<b>Taped</b> = FF	2,0mm = 20	35x80 = 3580		
		16V = 1C	CD <b>262</b> = QM	100 = 101	+30 / -10% = Q	<b>Long Lead</b> = LL	2,5mm = 25	45x100 = 45100		
		20V = 1D	CD <b>263</b> = BK	1000 = 102	+50 / -10% = T	Cut 5,0mm = CB	3,5mm = 35			
		25V = 1E	CD <b>269</b> = PH	10000 = 103		<b>Cut 4,5mm</b> = CC	5,0mm = 50			
		35V = 1V	CD <b>269L</b> = HL			Cut 4,0mm = CD	7,5mm = 75			
		40V = 1G	CD <b>281</b> = LL			Cut 3,5mm = CE	10,0mm = 10			
		50V = 1H	CD <b>281L</b> = LH			Cut 3,0mm = CF	12,5mm = 12			
		63V = 1J	CD <b>287</b> = GC			on request: alternative lead forms (Keyed Polarity, axial, 90° - angle, others)				
		80V = 1K	CD <b>28L</b> = QL			<b>Snap-In:</b>				
		100V = 2A	CD <b>293</b> = BZ			4,0mm Pin Length = T4	2 Pin = P2			
		160V = 2C	CD <b>294</b> = BW			<b>6,3mm Pin Length</b> = T6	3 Pin = P3			
		180V = 2K	CD <b>295</b> = BC			Soldering Pin = S4	4 Pin = P4			
		200V = 2D	CD <b>296</b> = KC			on request: alternative pin types				
		250V = 2E	CD <b>297</b> = BB			5 Pin = P5				
		315V = 2F	CD <b>299</b> = PG			preferred				
		350V = 2V	CD <b>29D</b> = HR							
		385V = 2J	CD <b>29H</b> = QH							
		400V = 2G	CD <b>29L</b> = QL							
		415V = 2P	CD <b>891</b> = ZJ							
		420V = 2X	CD <b>892</b> = ZL							
		450V = 2W	CD <b>895</b> = ZK							
		500V = 2H								
		550V = 2Y	Polymer on request							

## Technical Specification **Radial Type**

### Dimensions for loose, long-lead type (bulk)

Order Code: LL



L	L ≤ 7					L ≥ 11									
$\varnothing D$	3	4	5	6,3	8	5	6,3	8	10	12,5	16	18	20	22	25
F	1	1,5	2,0	2,5	3,5	2,0	2,5	3,5	5,0	7,5	10,0	12,5	15,0	17,5	20,0
$\varnothing d$	0,4	0,45				0,5	0,6			0,8	1,0				
$a_{\text{Max}}$	1,0					2,0									

For diameter 20 pitch 7,5 on request.

in mm

### Dimensions for loose, short cut leads (bulk)

Order Code: CC (CB, CD, CE, CF)

	Straight Lead		Bended Lead			
<b>Code</b>	CB	<b>CC</b>	CD	CE	CF	
<b>I</b>	5,0 ± 0,5	<b>4,5 ± 0,5</b>	4,0 ± 0,5	3,5 ± 0,5	3,0 ± 0,5	

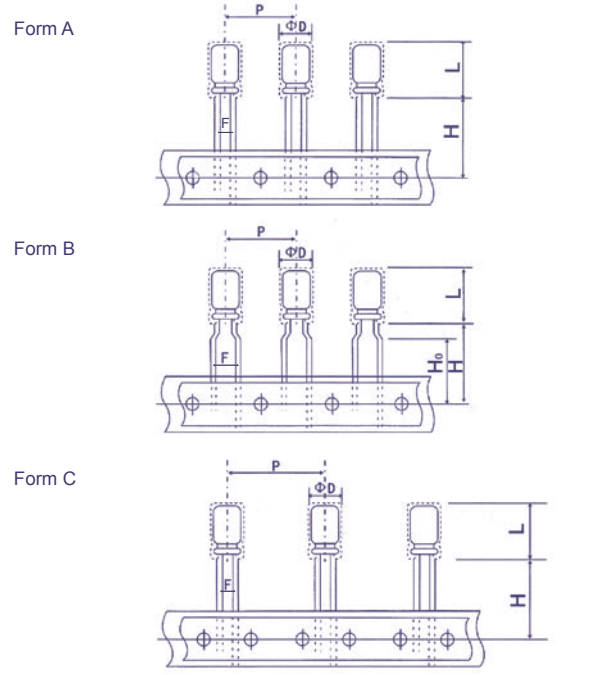
preferred

in mm

## Dimensions for Ammopack taping

Order Code: FF (FD)

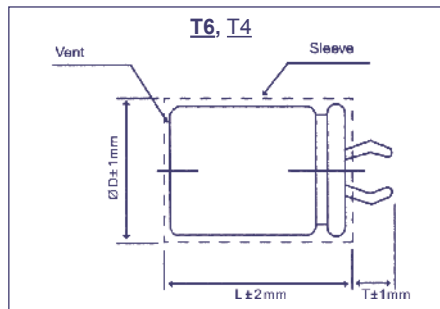
Code	Case Range		Dimensions				Form
	Ø D	L (max)	H ± 0,75	Ho ± 0,5	F <sup>+0,8</sup> <sub>-0,2</sub>	P ± 0,1	
FF	4 ~ 5	13	18,5	-	2,5	12,7	B
	6,3	13	18,5	-	2,5	12,7	A
	8	13	18,5	-	3,5	12,7	
	4 ~ 8	7	17,5	16	5,0	12,7	B
	5 ~ 6,3	13	18,5				
	8	22	20,0				
		10	22	18,5	-	-	15,0
	12,5	27	18,5	-	-	-	C
FD	12,5	27	18,5	-	-	25,4	
FF	16	27	18,5	-	7,5	30,0	



in mm

## Technical Specification Snap-In Type

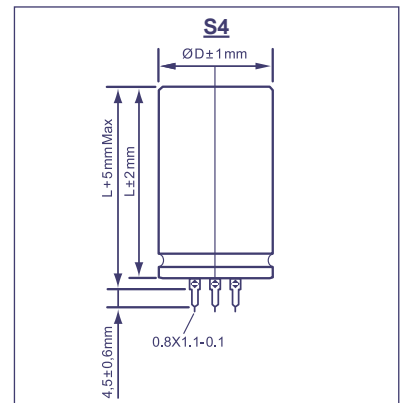
Pin Type: Snap-In Order Code: T6, T4



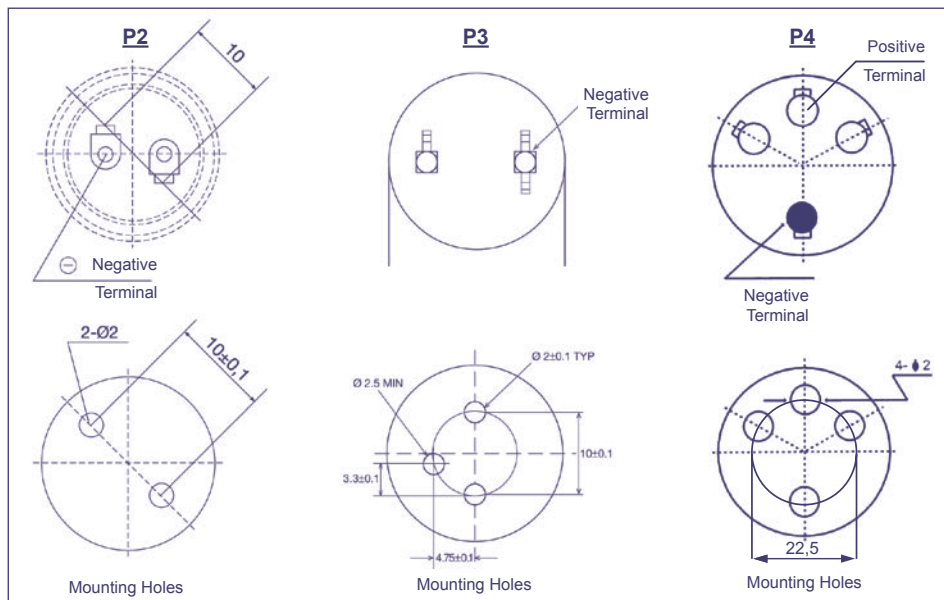
Terminal	T6	T4
Pin Length	6,3	4,0

**preferred**

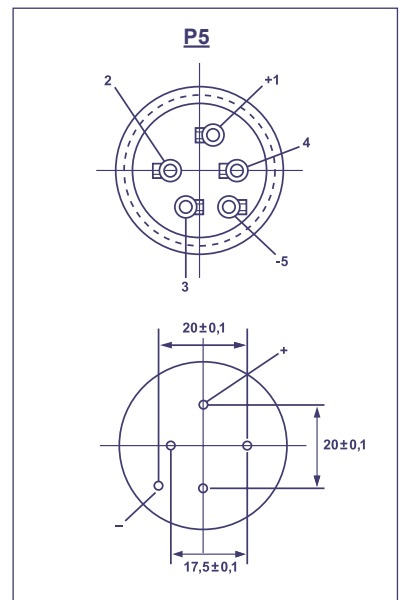
Pin Type: Soldering Order Code: S4



Snap-In Terminal Order Code: P2, P3, P4 and Mounting Holes (Top view)



Soldering Terminal Order Code: P5



P3 only as T4 Terminal available, P4 for Ø D ≥ 30mm, P5 for Ø D ≥ 40mm