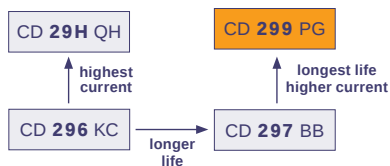


9000h at 105°C

- Extended Lifetime at 105°C
- High Ripple Current
- High Professional Industrial Power Supplies



Item	Characteristics	
Operating Temperature Range (°C)	-40 ~ +105	-25 ~ +105
Voltage Range (V)	160 ~ 250	315 ~ 450
Capacitance Range (µF)	39 ~ 2200	
Capacitance Tolerance (20°C, 120Hz)	± 20%	
Leakage Current (µA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0,01CV or 1,5mA, whichever is smaller C: Nominal Capacitance (µF) V: Rated Voltage (V)	
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	160 180 200 250 315 350 400 450
	Tan δ (max)	0,15 0,20
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	≤ 250 315 ~ 450
	Z _{-25°C} / Z _{+20°C}	3 8
	Z _{-40°C} / Z _{+20°C}	12 -

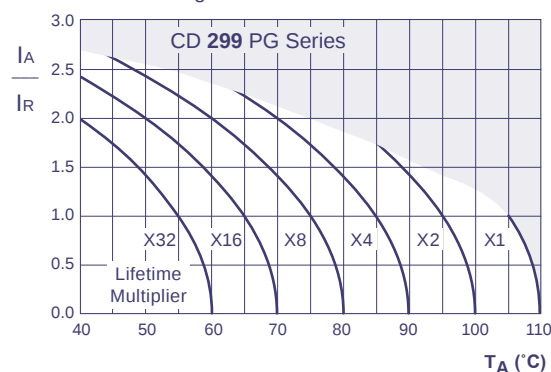
	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	9000h	>200000h	7000h	7000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacity Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition:	U _R	U _R	U _R	U _R	U _R = 0
Applied Voltage	I _R	1,4 x I _R	I _R	I _R = 0	I _R = 0
Applied Current	105°C	50°C	105°C	105°C	105°C
Applied Temperature	≤ 1% Failure Rate	≤ 1% Failure Rate	guaranteed		After test: U _R to be applied for 30min >24h before measurement
Failure Rate Level					

Multiplier for Ripple Current

Frequency Coefficient

Frequency	50Hz	60Hz	120Hz	300Hz	1kHz	≥50kHz
Rated Voltage (V)						
160 ~ 250	0,81	0,85	1,00	1,17	1,45	1,50
315 ~ 450	0,77	0,82	1,00	1,16	1,41	1,43

Lifetime Diagram



I_A = actual ripple current at 120Hz, I_R = rated ripple current at 120Hz, 105°C
Multiplier of Useful Life as a function of ambient temperature and ripple current load

V _{DC} (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Max Ripple Current 105°C, 120Hz	Size Ø D x L
(V)	(µF)	(mΩ)	(mΩ)	(Arms)	(mm)
160 (200) 2C	270	737	516	1.10	22 x 25
	330	603	423	1.20	22 x 30
	390	511	358	1.30	25 x 25
	470	424	297	1.40	22 x 35
		424	297	1.40	25 x 30
	560	356	249	1.50	22 x 40
		356	249	1.50	30 x 25
	680	293	205	1.70	22 x 45
		293	205	1.70	25 x 35
		293	205	1.70	30 x 30
	820	243	170	2.00	25 x 40
	1000	199	140	2.20	25 x 45
		199	140	2.20	30 x 35
	1200	166	117	2.30	25 x 50
		166	117	2.30	30 x 40
		166	117	2.30	35 x 35
	1500	133	93	2.50	30 x 45
		133	93	2.50	35 x 40
	1800	111	78	2.70	30 x 50
		111	78	2.70	35 x 45
	2200	91	64	2.90	35 x 50
180 (225) 2K	220	905	634	1.00	22 x 25
	330	603	423	1.20	22 x 30
		603	423	1.20	25 x 25
	470	424	297	1.40	22 x 35
		424	297	1.40	25 x 30
		424	297	1.40	30 x 25
	560	356	249	1.50	22 x 40
		356	249	1.50	25 x 35
	680	293	205	1.70	22 x 50
		293	205	1.70	25 x 40
		293	205	1.70	30 x 30
	820	243	170	2.00	25 x 45
		243	170	2.00	30 x 35
		243	170	2.00	35 x 30
	1000	199	140	2.20	30 x 40
	1200	166	117	2.30	30 x 45
		166	117	2.20	35 x 35
	1500	133	93	2.50	30 x 50
		133	93	2.50	35 x 40
	1800	111	78	2.70	35 x 45
	2200	91	64	2.90	35 x 50
200 (250) 2D	220	905	634	1.00	22 x 25
	270	737	516	1.10	22 x 30
		737	516	1.10	25 x 25
		511	358	1.30	22 x 35
	390	511	358	1.30	25 x 30
		511	358	1.30	30 x 25
		424	297	1.40	22 x 40
	470	424	297	1.40	25 x 35
		424	297	1.40	30 x 30
		356	249	1.50	22 x 45
	680	293	205	1.70	25 x 40
		293	205	1.70	30 x 35
		243	170	2.00	25 x 50
	820	243	170	2.00	30 x 40
		243	170	2.00	35 x 30
		199	140	2.20	30 x 45
	1000	199	140	2.20	35 x 35
		166	117	2.30	30 x 50
		166	117	2.30	35 x 40
	1500	133	93	2.50	35 x 50
250 (300) 2E	180	1106	774	0.90	22 x 30
	220	905	634	1.00	25 x 25
		737	516	1.10	22 x 35
		737	516	1.10	25 x 30
	270	737	516	1.10	30 x 25
		603	423	1.20	22 x 40
		603	423	1.20	25 x 35
	330	511	358	1.30	22 x 45
		511	358	1.30	25 x 40
		511	358	1.30	30 x 30
	390	424	297	1.40	25 x 45
		424	297	1.40	30 x 35
		424	297	1.40	35 x 30
	560	356	249	1.50	25 x 50
	680	293	205	1.70	30 x 45
		293	205	1.70	35 x 35
		243	170	2.00	30 x 50
	820	243	170	2.00	35 x 40
		199	140	2.20	35 x 45
	1200	166	117	2.30	35 x 50
315 (365) 2F	82	2427	1335	0.64	22 x 25
	100	1990	1095	0.69	22 x 30
	120	1658	912	0.75	25 x 25

V _{DC} (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Max Ripple Current 105°C, 120Hz	Size Ø D x L
(V)	(µF)	(mΩ)	(mΩ)	(Arms)	(mm)
315 (365) 2F	150	1327	730	0.82	22 x 35
		1327	730	0.82	25 x 30
		1327	730	0.82	30 x 25
	180	1106	608	0.90	22 x 40
		1106	608	0.90	25 x 35
	220	905	498	1.00	22 x 45
		905	498	1.00	25 x 40
		905	498	1.00	30 x 30
	270	737	406	1.10	25 x 45
		737	406	1.10	30 x 35
		737	406	1.10	35 x 30
	330	603	332	1.20	25 x 50
		603	332	1.20	30 x 40
	390	511	281	1.30	30 x 45
		511	281	1.30	35 x 35
	470	424	233	1.40	30 x 50
		424	233	1.40	35 x 40
	560	356	196	1.50	35 x 45
	680	293	161	1.70	35 x 50
350 (400) 2V	82	2427	1335	0.64	22 x 25
	100	1990	1095	0.69	22 x 30
		1990	1095	0.69	25 x 25
	120	1658	912	0.75	22 x 35
		1658	912	0.75	25 x 30
	150	1327	730	0.82	22 x 40
		1327	730	0.82	30 x 25
		1106	608	0.90	22 x 45
	180	1106	608	0.90	25 x 35
		1106	608	0.90	30 x 30
		905	498	1.00	22 x 50
	220	905	498	1.00	25 x 40
		737	406	1.10	25 x 50
		737	406	1.10	30 x 35
	270	737	406	1.10	35 x 30
		603	332	1.20	30 x 45
		603	332	1.20	35 x 35
	390	511	281	1.30	30 x 50
		511	281	1.30	35 x 40
	560	356	196	1.50	35 x 50
400 (450) 2G	56	3553	1954	0.51	22 x 25
	68	2926	1610	0.56	22 x 30
	82	2926	1610	0.56	25 x 25
	100	2427	1335	0.64	22 x 35
		1990	1095	0.69	25 x 30
		1658	912	0.75	22 x 40
	120	1658	912	0.75	25 x 35
		1658	912	0.75	30 x 25
		1327	730	0.82	22 x 50
	150	1327	730	0.82	25 x 40
		1327	730	0.82	30 x 30
		1106	608	0.90	25 x 45
	180	1106	608	0.90	30 x 35
		1106	608	0.90	35 x 25
		905	498	1.00	25 x 50
	220	905	498	1.00	30 x 40
		905	498	1.00	35 x 30
		737	406	1.10	30 x 45
	270	737	406	1.10	35 x 35
		603	332	1.20	30 x 50
		603	332	1.20	35 x 40
450 (500) 2W	390	511	281	1.30	35 x 45
	470	424	233	1.40	35 x 50
	39	6802	3061	0.37	22 x 25
	47	5644	2540	0.40	22 x 30
	56	4737	2132	0.47	22 x 35
		4737	2132	0.47	25 x 25
		3901	1756	0.53	22 x 40
	68	3901	1756	0.53	25 x 30
		3235	1456	0.56	22 x 45
		3235	1456	0.56	25 x 35
	82	3235	1456	0.56	30 x 25
		2653	1194	0.64	22 x 50
		2653	1194	0.64	25 x 40
	100	2653	1194	0.64	30 x 30
		2211	995	0.72	25 x 45
		1769	796	0.79	25 x 50
	150	1769	796	0.79	30 x 40
		1769	796	0.79	35 x 30
		1474	664	0.87	30 x 45
	180	1474	664	0.87	35 x 35
		1206	543	1.00	30 x 50
		1206	543	1.00	35 x 40
	270	983	443	1.19	35 x 45
	330	804	362	1.38	35 x 50

Custom products are available on request.

Part Number System



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

EC	R	1C	PT	101	M	FF	25	0611	JExxxxx
Technology	Terminal Type	Rated Voltage Code	Series Code	Capacitance Code (in μF)	Capacitance Tolerance	Lead Form	Terminal/Pitch Size	Dimension	for Specials only
EC = Electrolytic Capacitor	SMD = V	For coding please refer to the pages of ratings	CD VS = BS	0,47 = R47	$\pm 20\%$ = M	SMD:		4x7 = 0407	
	Radial = R		CD VH = VH	1,0 = 010	$\pm 10\%$ = K	Taped = FF		5x11,5 = 0511	
PC = Polymer Capacitor	Snap-In = S		CD VZ = VZ	2,2 = 2R2	+30 / -10% = Q	Radial:		6,3x11,5 = 0611	
			CD 261 = LK	100 = 101	+50 / -10% = T	Long Lead = LL		35x80 = 3580	
			CD 261X = QX	1000 = 102		Cut 5,0mm = CB		45x100 = 45100	
			CD 262 = QM	10000 = 103		Cut 4,5mm = CC			
			CD 263 = BK			Cut 4,0mm = CD			
			CD 269 = PH			Cut 3,5mm = CE			
			CD 281 = LL			Cut 3,0mm = CF			
			CD 284 = XY			on request: alternative lead forms (axial, 90° - angle, others)		12,5mm = 12	
			CD 287 = GC						
			CD 28L = QL						
			CD 293 = BZ						
			CD 294 = BW						
			CD 295 = BC						
			CD 296 = KC						
			CD 297 = BB						
			CD 299 = PG						
			CD 29D = HR						
			CD 29H = QH						
			CD 29L = QL						
			HCP = CP						
			HPM = PM						
			HVC = VC						

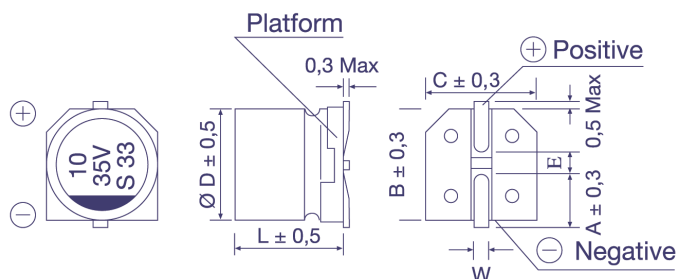
Snap-In:

4,0mm Pin Length = T4	2 Pin = P2
6,3mm Pin Length = T6	3 Pin = P3
Soldering Pin = S4	4 Pin = P4
	5 Pin = P5

preferred

Technical Specification **SMD Type**

Dimensions

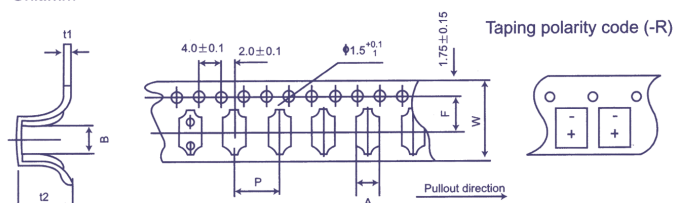


Ø D x L	4x5,4	5x5,4	6,3x5,4	6,3x7,7	8x10,5	8x11,8	10x10,5	10x12,7
A	1,8	2,1	2,4	2,5	2,9	2,9	3,2	3,2
B	4,3	5,3	6,6	6,6	8,3	8,4	10,3	10,4
C	4,3	5,3	6,6	6,6	8,3	8,4	10,3	10,4
E	1,0	1,3	2,2	2,2	3,1	3,1	4,5	4,5
L	5,4	5,4	5,4	7,7	10,5	11,8	10,5	12,7
W	0,5 - 0,8				0,7 - 1,1			

in mm

Taping Dimensions

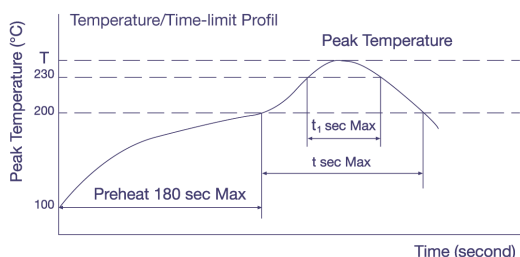
Unit:mm



Size (DxL)	w $\pm 0,3$	A $\pm 0,2$	B $\pm 0,2$	P $\pm 0,1$	t2 $\pm 0,2$	F $\pm 0,1$	t1 $\pm 0,1$
4 x 5,4	12,0	5,0	5,0	8,0	5,8	5,5	0,4
5 x 5,4	12,0	6,0	6,0	12,0	5,8	5,5	0,4
6,3 x 5,4	16,0	7,0	7,0	12,0	5,8	7,5	0,4
6,3 x 7,7	16,0	7,0	7,0	12,0	8,4	7,5	0,4
8 x 10,5	24,0	8,7	8,7	16,0	11,0	11,5	0,5
8 x 11,8	24,0	8,7	8,7	16,0	12,3	11,5	0,5
10 x 10,5	24,0	10,7	10,7	16,0	11,0	11,5	0,5
10 x 12,7	24,0	10,7	10,7	16,0	14,0	11,5	0,5

in mm

Soldering Profile (Aluminium Electrolytic Capacitors)

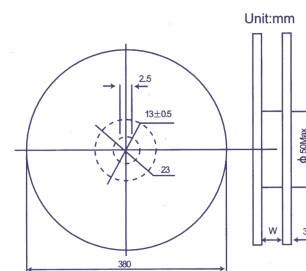


Allowable Range of Peak Temperature

Size	T (°C)	t (second)	t ₁ (second)
Ø 4 ~ 6,3	250	90	40
Ø 8 x 10,5	240	90	30
Ø 10 x 10,5	235	60	30

Diameter	w	D
4; 5	14 ± 1	50 ± 1
6,3	18 ± 1	50 ± 1
8; 10	25 ± 1	50 ± 1
Polymer	25 ± 1	80 ± 1

in mm

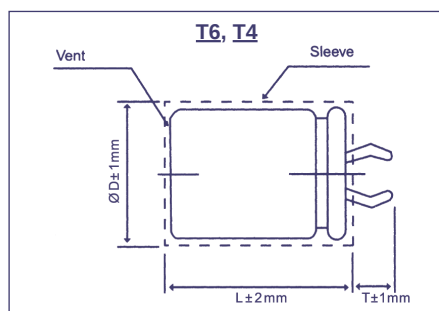


For more details or Soldering Profiles of Radials or Polymer-Capacitors please contact our local Sales Offices.

Technical Specification **Snap-In Type**

Pin Type: Snap-In

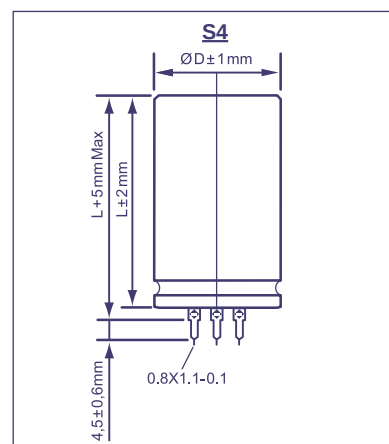
Order Code: T6, T4



Terminal	T6	T4
Pin Length T	6,3	4,0

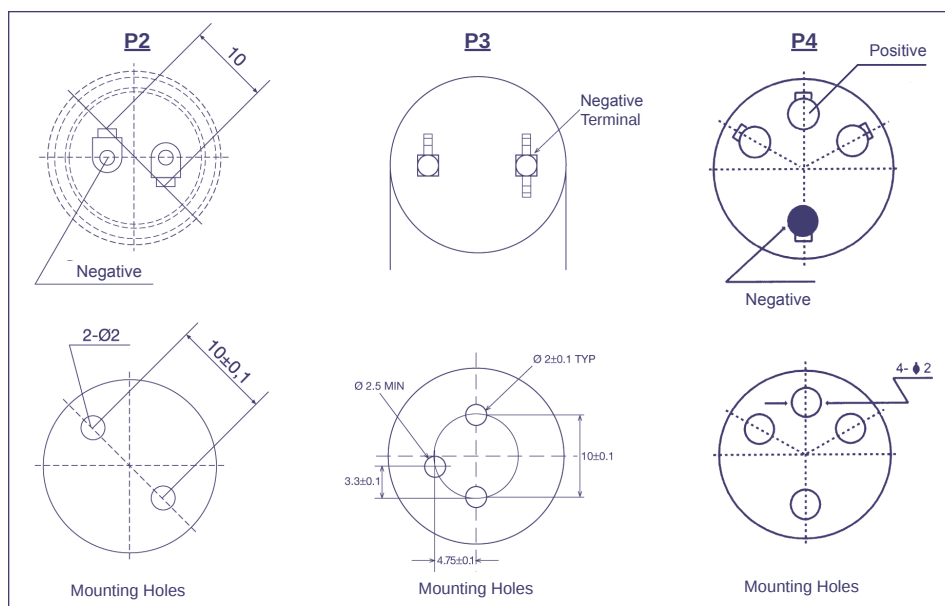
Pin Type: Soldering

Order Code: S4



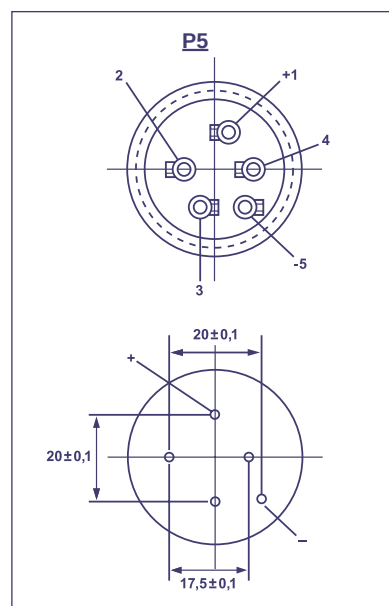
Snap-In Terminal

Order Code: P2, P3, P4



Soldering Terminal

Order Code: P5



P3 only T4 Terminal

Order Code **Screw Type**

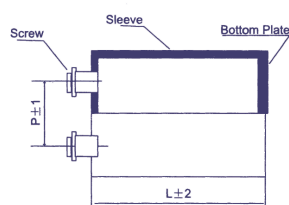
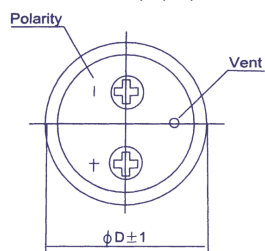
EC	G	1C	BP	101	M	B	E	160	A361	JExxxxx
Technology	Terminal Type	Rated Voltage Code	Series Code	Capacitance Code	Capacitance Tolerance	Mounting	Diameter	Length	For Terminal Code see tables below	for Specials only
EC = Electrolytic Capacitor	Screw = G	For coding please refer to the pages of ratings	CD 135 = BP	100 = 101	±20% = M	Bolt = B	36 = A	53 = 053		
			CD 136 = PK	1000 = 102	±10% = K	No double sleeve = N	40 = B	65 = 065		
			CD 137 = PX	10000 = 103	+30 / -10% = Q	2 stoppers bracket+double sleeve* = I	51 = C	96 = 096		
			CD 138 = PC		+20 / -0% = R	3 stoppers bracket+double sleeve* = Y	64 = D	100 = 100		
			CD 139 = BL		+50 / -10% = T	No bracket, but double sleeve* = D	77 = E	115 = 115		
					preferred	* Double sleeve for diameter ≥ 51 only	90 = F	236 = 236		
							101 = G			

Technical Specification **Screw Type**

Dimensions

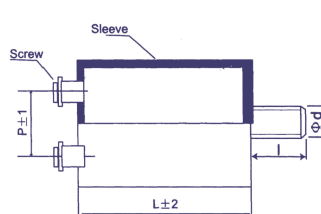
Standard Housing

Order Code: I, Y, D, N



Bolt Housing

Order Code: B



Ø D	Ø d	I
Ø 36	M8	12
≥ Ø 51	M12	16

in mm