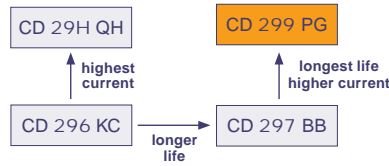


9000h at 105°C

- 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 -

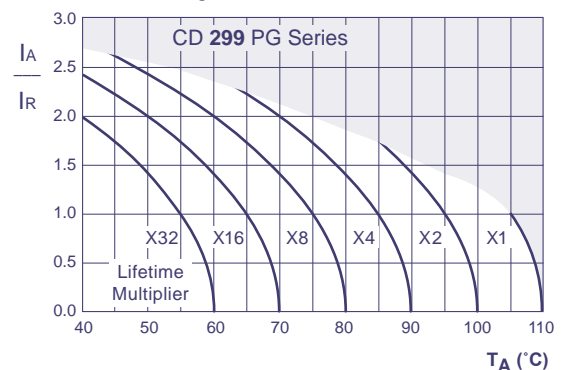
	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	9000h	>200000h	7000h	7000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacity Change	Within ± 30% of initial value		Within ± 20% of initial value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

Multiplier for Ripple Current

Frequency Coefficient

Rated Voltage (V)	Frequency					
	50Hz	60Hz	120Hz	300Hz	1kHz	≥50kHz
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



Ratings for CD 299 PG Series

V _{DC} (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Max Ripple Current 105°C, 120Hz	Size ∅ 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	
	560	424	297	1.40	30 x 25	
		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	
	1000	243	170	2.00	35 x 30	
		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		
	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	
	390	511	358	1.30	22 x 35	
		511	358	1.30	25 x 30	
		511	358	1.30	30 x 25	
	470	424	297	1.40	22 x 40	
		424	297	1.40	25 x 35	
	560	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	
		293	205	1.70	30 x 50	
	820	243	170	2.00	25 x 40	
		243	170	2.00	30 x 40	
		243	170	2.00	35 x 30	
	1000	199	140	2.20	30 x 45	
		199	140	2.20	35 x 35	
	1200	166	117	2.30	30 x 50	
		166	117	2.30	35 x 40	
	1500	133	93	2.50	35 x 50	
		180	1106	774	0.90	22 x 30
	250 (300) 2E	220	905	634	1.00	25 x 25
		270	737	516	1.10	22 x 35
737			516	1.10	25 x 30	
737			516	1.10	30 x 25	
330		603	423	1.20	22 x 40	
		603	423	1.20	25 x 35	
390		511	358	1.30	22 x 45	
		511	358	1.30	25 x 40	
		511	358	1.30	30 x 30	
470		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	
820		243	170	2.00	30 x 50	
		243	170	2.00	35 x 40	
1000		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
	1658		912	0.75	25 x 30	

V _{DC} (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Max Ripple Current 105°C, 120Hz	Size ∅ 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	
		905	498	1.00	22 x 45	
	220	905	498	1.00	25 x 40	
		905	498	1.00	30 x 30	
		737	406	1.10	25 x 45	
	270	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	
		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	
270		737	406	1.10	30 x 35	
		737	406	1.10	35 x 30	
		603	332	1.20	30 x 45	
330		603	332	1.20	35 x 35	
		511	281	1.30	30 x 50	
390	511	281	1.30	35 x 40		
	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	
	120	1990	1095	0.69	25 x 30	
		1658	912	0.75	22 x 40	
	150	1658	912	0.75	25 x 35	
		1658	912	0.75	30 x 25	
		1327	730	0.82	22 x 50	
	180	1327	730	0.82	25 x 40	
1327		730	0.82	30 x 30		
220	1106	608	0.90	25 x 45		
	1106	608	0.90	30 x 35		
	1106	608	0.90	35 x 25		
270	905	498	1.00	25 x 50		
	905	498	1.00	30 x 40		
330	905	498	1.00	35 x 30		
	737	406	1.10	30 x 45		
390	737	406	1.10	35 x 35		
	603	332	1.20	30 x 50		
470	603	332	1.20	35 x 40		
	511	281	1.30	35 x 45		
450 (500) 2W	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	
	68	3901	1756	0.53	22 x 40	
		3901	1756	0.53	25 x 30	
	82	3235	1456	0.56	22 x 45	
		3235	1456	0.56	25 x 35	
		3235	1456	0.56	30 x 25	
	100	2653	1194	0.64	22 x 50	
		2653	1194	0.64	25 x 40	
		2653	1194	0.64	30 x 30	
120	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		
220	1206	543	1.00	35 x 40		
	983	443	1.19	35 x 45		
330	804	362	1.38	35 x 50		

Snap-In

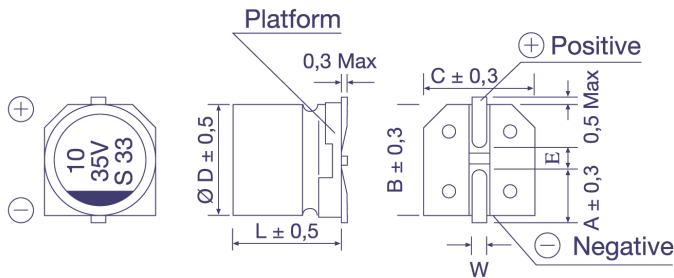
Custom products are available on request.

Order Code SMD, Radial, Snap-In

EC	R	1C	PT	101	M	FF	25	0611	JE xxxxx
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	Terminal = T2	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	2,0mm = 20	35x80 = 3580	
			CD 261X = QX	1000 = 102		Cut 5,0mm = CB	2,5mm = 25	45x100 = 45100	
			CD 262 = QM	10000 = 103		Cut 4,5mm = CC	3,5mm = 35		
			CD 263 = BK			Cut 4,0mm = CD	5,0mm = 50		
			CD 269 = PH			Cut 3,5mm = CE	7,5mm = 75		
			CD 281 = LL			Cut 3,0mm = CF	10,0mm = 10		
			CD 284 = XY			on request: alternative lead forms (axial, 90° - angle, others)		12,5mm = 12	
		CD 287 = GC			Snap-In:				
		CD 28L = QL			4,0mm Pin Length = T4	2 Pin = P2			
		CD 293 = BZ			6,3mm Pin Length = T6	3 Pin = P3			
		CD 294 = BW			Soldering Pin = S4	4 Pin = P4			
		CD 295 = BC				5 Pin = P5			
		CD 296 = KC			preferred				
		CD 297 = BB							
		CD 299 = PG							
		CD 29D = HR							
		CD 29H = QH							
		CD 29L = QL							
		HCP = CP							
		HPM = PM							
		HVC = VC							

Technical Specification SMD Type

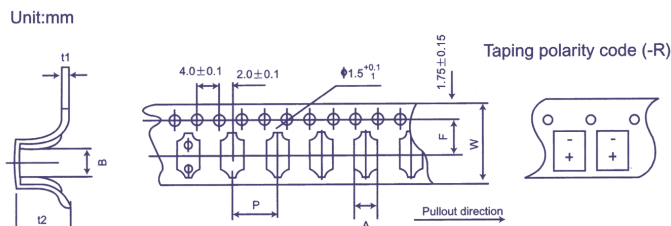
Dimensions



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

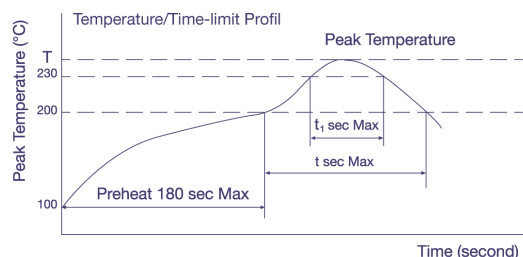
Taping Dimensions



Size (DxL)	w ± 0,3	A ± 0,2	B ± 0,2	P ± 0,1	t2 ± 0,2	F ± 0,1	t1 ± 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)

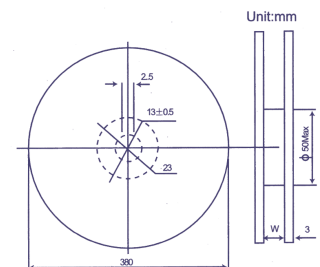


Allowable Range of Peak Temperature

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

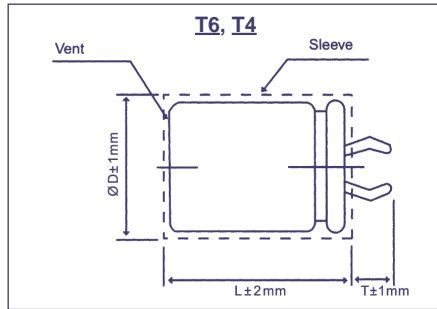


Unit:mm

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

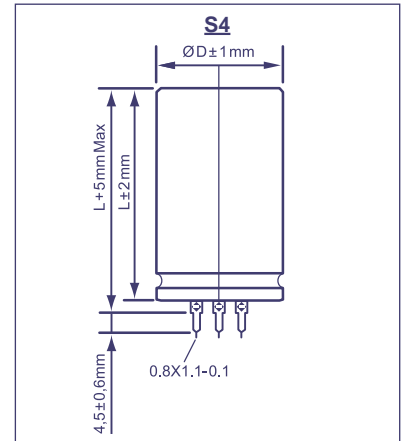
Technical Specification Snap-In Type

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

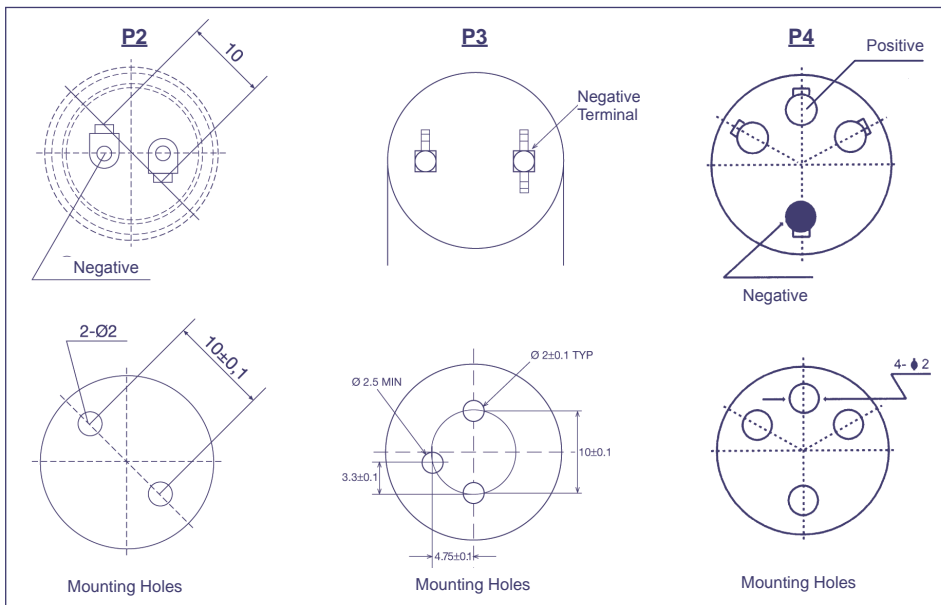


Terminal	T6	T4
Pin Length T	6,3	4,0

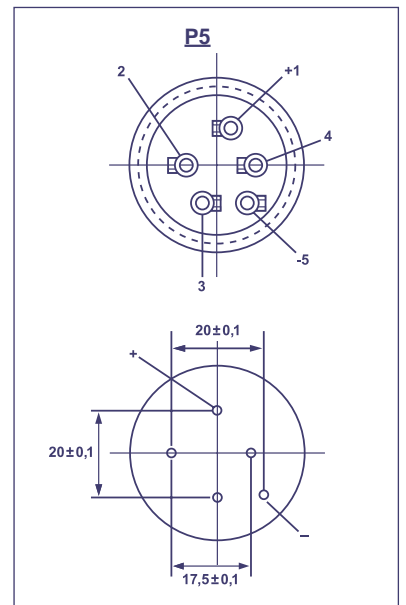
Pin Type: Soldering
Order Code: S4



Snap-In Terminal
Order Code: P2, P3, P4



Soldering Terminal
Order Code: P5



P3 only T4 Terminal

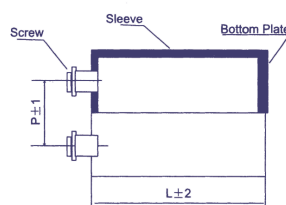
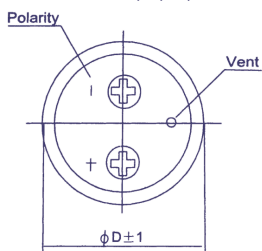
Order Code Screw Type

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			

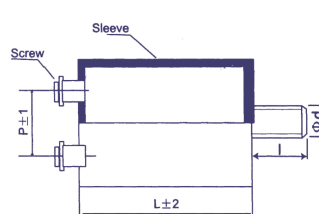
Technical Specification Screw Type

Dimensions

Standard Housing
Order Code: I, Y, D, N



Bolt Housing
Order Code: B



Ø D	Ø d	l
Ø 36	M8	12
≥ Ø 51	M12	16

in mm