

SPECIFICATION AVAILABLE FROM:

NATIONAL STANDARDS AUTHORITY OF IRELAND
GLASNEVIN DUBLIN 9 IRELAND

TELEPHONE: (01)370101 TELEX: 32501 OLAS EI

CECC 30 202-011

ISSUE 1 : MARCH 1989

Page 1 of 21



Electronic Components of Assessed
Quality-Detail Specification in
Accordance with:

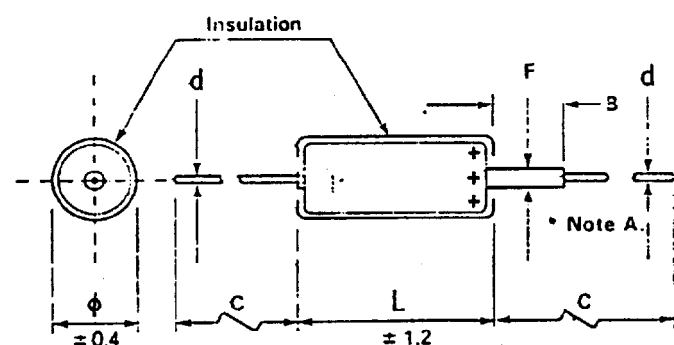
CECC 30 000 (I.S. 569)
CECC 30 200 (I.S. 572)
CECC 30 202 (I.S. 628)

I.S. : 1989

(CECC 30 202-011 : 1989)

Outline and Dimensions

First Angle Projection



* Note A. The anode lead out stub must not be bent.

All dimensions are in millimetres (see Table 1 below).

Marking information see Clause 5.

DETAIL SPECIFICATION: FIXED
TANTALUM CAPACITORS WITH
NON-SOLID ELECTROLYTE, POROUS
ANODE (SUB-FAMILY 2)

CONSTRUCTION:

Cylindrical metal core with
insulating sleeve and axial
termination. All tantalum
construction.

Assessment level E.
Long life grade.

QUICK REFERENCE DATA:

Capacitance range 2.7 uF to 2200 uF. Capacitance tolerance: $\pm 20\%$, $\pm 10\%$, $\pm 5\%$.
D.C. rated voltage 6V to 125V. Climatic category 55/125/56. Performance grade:
long life.

Information about manufacturers who have components qualified to this detail
specification is available in the current CECC 00 200 : Qualified Products List.

1. GENERAL DATA

1.1 Recommended method of mounting

The axial wire leads are intended for electrical connections and not for mechanical fixing. For vibration, bump and shock testing the component shall be mounted by clamping the body and the terminations.

1.2 Dimensions

TABLE 1

Case Size	Dimensions (in mm)					
	$\emptyset$	L	C	d	B max	F max
T1	5.2 ± 0.4	12.7 ± 1.2	38 ± 5	0.64 ± 0.05	6.35	1.58
T2	7.6 ± 0.4	17.5 ± 1.2	57 ± 5	0.64 ± 0.05	6.35	1.58
T3	9.9 ± 0.4	20.6 ± 1.2	57 ± 5	0.64 ± 0.05	6.35	1.58
T4	9.9 ± 0.4	28.2 ± 1.2	57 ± 5	0.64 ± 0.05	6.35	1.58

1.3 Ratings and characteristics

Capacitance range	(See Table 2A)
Tolerance on rated capacitance	$\pm 20\%$, $\pm 10\%$, $\pm 5\%$.
Rated voltage	(See Table 2A)
Category voltage	(See Table 2A)
Climatic category	55/125/56
Rated temperature	85°C
Capacitance change with temperature	(See Table 2B)
Tangent of loss angle	(See Table 2B)
Leakage current	(See Table 2B)
Impedance	(See Table 2B)
Reverse voltage	3V at 85°C or 2V at 125°C

TABLE 2A (1)

PREFERRED RANGECASE SIZES RELATED TO CAPACITANCE AND VOLTAGE VALUES

Rated voltage @ 85°C	6.3	10	16	25	40	63	75	100	125
Category Voltage @ 125°C	4	6.3	10	16	25	40	50	63	85
Rated (uF) Capacitance	Case Size								
2.7	<								T1
3.3	<								T1
3.9	<								T1
4.7	<								
5.6	<							T1	
6.8	<						T1	T1	
8.2	<						T1		
10.0	<					T1			
12.0	<					T1			
15.0	<				T1	T1	<		T2
18.0	<				T1	<			T2
22.0	<			T1	T1	<		T2	
27.0	<			T1					
33.0	<		T1	T1	<		T2	T2/T3	
39.0	<		T1	T1	<			T2/T3	T3
47.0	<	T1	T1	<		T2	T2	T3	T3
56.0	<		T1	<		T2	<	T3	
68.0	T1	T1	<		T2	<	T2/T3	T4/T3	T4
82.0	<	T1	<			T2	T3	T4	T4
100	<	T1	<	T2	T2	T3	T3		
120	T1	<	T2	<	T2	T3	T4		
150	T1	T2	<	T2	T3	T4	T3/T4		
180	<	T2	<	T2	<		T3		
220	T2	<	T2	T3	T4	T3	T4		
270	<		T2	<	T3	T4			
330	<	T2	T3	T4	T3	T4			
390	<	T2	<	T4/T3	T4				
470	T2	T3	T4	T3	T4				
560	T3/T2	<	T4	T3					
680	<	T4	T3	T4					
820	<	T4	T3	T4					
1000	T4	T3	T4						
1200	<	T3	T4						
1500	T3	T4							
1800	<	T4							
2200	T4								

NOTE: 1. T Notation indicates case size - see Table 1
 2. The capacitors may be used at lower voltages this is indicated by the arrows.

TABLE 2A (2)

NON PREFERRED RANGE TO GIVE MIL-C CAPACITANCE AND VOLTAGE VALUES

CASE SIZES RELATED TO CAPACITANCE AND VOLTAGE VALUES

Rated voltage @ 85°C	6	8	10	15	25	30	50	60	75	100	125
Category voltage @ 125°C	4	5	7	10	15	20	30	40	50	65	85
Rated (uF) Capacitance	Case Size										
3.5	<								T1		T1
3.6	<										
4.0	<							T1			
5.0	<						T1				
8.0	<							T1			
8.2	<										
9	<										
10	<				T1	<	T1		T1		
14	<										
15	<			T1	<	T1	<		T2		T2
18	<						T1				
20	<		T1	<				T2			
22	<						T1				
25	<	T1	<				T1	T2	<		T3
30	T1	<								T2/T3	
33	<			T1	<	T1					
39	<							T2			
40	<						T2	<			
43	<				T1	<			T3		
47	<			T1	<		T2		T2		
50	<				T2	<		T3			
56	<	T1	<	T1					T2/T3	<	T4
60	<							T3			
68	T1	<					T2	<	T3		
70	<			T2							
82	<							T3	T2		
86	<										
100	<		T2	<		T3	T2			T4	
110	<										
120	<	T1/T2	<	T2	T3	T2			T4		
140	T2	<							T4		
150	<						T2/T3				
160	T1	<				T2	<	T4			
170	<						T2				
180	<					T3					
220	<	T2	<	T2					T3		
250	<		T3	<							
270	T2	<		T2/T3	<				T4		
290	<	T3	<	T2				T3	T4		
300	<		T2	<							
330	T3	<					T3/T4				
350	<		T2	<	T4		T3	<	T4		
390	<		T3	<			T3	T4			
430	<	T3/T2	<				T3	T4			
540	<			T4							
560	T2/T3	<					T4				
750	<		T4	T3							
850	<	T4	T3	T4	T4						
1200	T4	<									
1500	T3										
2200	T4										

NOTE: 1. T Notation indicates case size - see Table 1.
 2. The capacitors may be used at lower voltages this is indicated by the arrows.

TABLE 2B (1)

CHARACTERISTICS AT HIGH AND LOW TEMPERATURES

Case Size	UR Rated Voltage	CR Capacitance μF	Capacitance Change X			Maximum Values						
			-55°C	85°C	125°C	TAN δ X			Impedance 120Hz -55°C	Leakage Current (μA)		
						-55°C	20°C	85°C + 125°C		20°C	85°C	125°C (1)
T1	6.3	68	-40	14	16	120	15	15	60	1	2	2
T1	6.3	120	-41	15	16	210	21	21	81	1.5	3	3
T1	6.3	150	-42	16	16	300	34	34	80	2	9	9
T2	6.3	220	-44	16	18	320	40	36	30	1	6.5	6.5
T2	6.3	470	-60	20	20	720	90	90	46	2	10	10
T2	6.3	560	-68	20	20	850	106	106	48	2	10	10
T3	6.3	560	-64	18	20	440	50	50	25	2	16	16
T4	6.3	1000	-80	25	25	576	72	68	22	3	14	14
T3	6.3	1500	-90	25	25	1375	172	172	36	5	20	20
T4	6.3	2200	-90	25	25	1360	170	170	22	6	24	24
T1	10	47	-36	14	16	104	13	13	100	1	2	2
T1	10	68	-40	15	16	170	21	21	85	1.5	3	3
T1	10	82	-40	16	16	200	25	25	84	2	6	6
T1	10	100	-40	16	16	260	30	30	82	2	6	6
T2	10	150	-32	14	16	240	30	28	45	1	7	7
T2	10	180	-35	14	16	264	30	30	40	1	7	7
T2	10	330	-54	17	18	520	65	65	52	2	10	10
T2	10	390	-60	19	20	592	74	74	54	2	10	10
T3	10	470	-65	18	20	384	44	44	25	2	15	15
T4	10	680	-80	25	25	368	46	42	20	3	16	16
T4	10	820	-80	25	25	456	57	53	22	3	16	16
T3	10	1000	-80	25	25	736	92	92	36	4	16	16
T3	10	1200	-80	25	25	1096	137	137	36	5	20	20
T4	10	1500	-88	30	30	912	114	114	23	7	25	25
T4	10	1800	-88	30	30	1104	138	138	24	7	25	25
T1	16	33	-28	14	16	80	10	10	90	1	2	2
T1	16	47	-28	16	16	160	20	20	100	1.5	3	3
T1	16	56	-28	16	16	176	22	22	100	1.5	3	3
T2	16	120	-28	14	16	200	25	25	50	1	7	7
T2	16	220	-35	16	16	340	42	42	62	2	10	10
T2	16	270	-45	18	18	440	55	55	60	2	12	12
T3	16	330	-58	18	20	344	40	40	30	2	14	14
T4	16	470	-75	25	25	296	37	33	24	3	18	18
T4	16	560	-80	25	25	320	40	36	23	3	18	18
T3	16	680	-80	25	25	640	80	80	42	5	20	20
T3	16	820	-80	25	25	760	95	95	42	6	24	24
T4	16	1000	-82	25	25	736	92	92	25	8	32	32
T4	16	1200	-84	25	30	824	103	103	25	8	32	32
T1	25	22	-20	10	12	56	7	7	140	1	2	2
T1	25	27	-20	12	12	94	11	11	140	1.5	3	3
T1	25	33	-24	14	14	106	13	13	130	1.5	3	3
T1	25	39	-28	16	16	128	16	16	120	2	9	9
T2	25	100	-28	13	15	168	21	21	50	1	9	9
T2	25	150	-35	15	15	270	35	32	62	2	10	10
T2	25	180	-48	14	15	290	35	34	60	2	10	10
T3	25	220	-52	18	20	280	35	33	33	2	13	13
T4	25	330	-60	25	25	240	30	28	27	3	20	20
T3	25	390	-70	25	25	384	48	48	48	7	28	28
T4	25	470	-68	25	25	280	35	32	24	3	20	20
T3	25	560	-80	25	25	400	48	48	48	7	28	28
T4	25	680	-80	25	25	480	60	60	48	7	28	28
T4	25	820	-80	25	25	480	60	60	24	8	32	32
T1	40	15	-20	10	12	56	7	7	175	1	2	2
T1	40	18	-20	12	12	80	10	10	200	1.5	4	4
T1	40	22	-24	12	12	94	11	11	190	1.5	4	4
T2	40	68	-24	13	15	120	15	15	60	1	8	8
T2	40	100	-40	15	15	190	25	25	60	2	10	10
T2	40	120	-32	15	15	220	30	30	62	2	12	12
T3	40	150	-48	14	15	184	23	23	35	2	12	12
T4	40	220	-58	23	23	184	23	22	27	3	22	22
T3	40	270	-60	25	25	344	37	37	52	7	28	28

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TABLE 2B (1) (continued)

Case Size	UR Rated Voltage	CR Capacitance μF	Capacitance Change %			Maximum Values						
			-55°C	85°C	125°C	TAN δ %			Impedance 120Hz -55°C	Leakage Current (μA)		
						-55°C	20°C	85°C + 125°C		20°C	85°C	125°C (1)
T3	40	330	-65	25	25	368	43	43	52	8	32	32
T4	40	390	-75	25	25	344	43	43	30	8	32	32
T4	40	470	-80	25	25	360	45	45	30	9	36	36
T1	63	10	-20	8	9	32	4	4	250	1	2	2
T1	63	12	-20	8	9	67	7	7	233	2	4	4
T1	63	15	-22	9	9	72	8	8	220	2	9	9
T2	63	47	-24	13	15	104	13	13	70	1	9	9
T2	63	56	-26	14	15	112	18	18	72	2	12	12
T2	63	82	-36	15	15	144	22	22	70	2	12	12
T3	63	100	-37	14	15	144	18	18	42	2	11	11
T3	63	120	-40	18	18	160	20	20	49	3	18	18
T4	63	150	-45	20	20	136	17	17	27	3	22	22
T3	63	220	-50	25	25	344	37	37	55	8	32	32
T4	63	270	-70	24	25	186	26	26	33	9	36	36
T4	63	330	-72	25	25	248	32	32	31	10	40	40
T1	75	6.8	-20	8	9	24	3	3	300	1	2	2
T1	75	8.2	-22	9	9	36	6	6	280	1.5	3	3
T2	75	33	-24	10	12	80	10	10	90	1	9	9
T2	75	47	-30	14	14	124	15	15	87	2	10	10
T2	75	68	-36	15	15	168	21	21	86	2	12	12
T3	75	68	-30	14	15	104	13	13	50	2	10	10
T3	75	82	-32	15	15	120	15	15	45	2	10	10
T3	75	100	-36	17	18	150	19	19	60	8	32	32
T4	75	120	-36	20	20	96	12	12	28	3	24	24
T3	75	150	-40	20	20	200	25	25	60	9	36	36
T4	75	150	-48	21	22	136	17	17	30	9	36	36
T3	75	180	-50	22	22	280	28	28	60	9	36	36
T4	75	220	-60	22	22	296	37	37	32	10	40	40
T1	100	4.7	-16	7	8	24	3	3	500	1	2	2
T1	100	5.6	-17	8	8	36	6	6	475	2	5	5
T2	100	22	-16	8	8	64	8	8	100	1	9	9
T2	100	33	-16	8	8	92	14	14	95	3	15	15
T3	100	33	-16	8	8	58	7	7	93	2	10	10
T2	100	39	-24	12	12	90	10	10	92	2	12	12
T3	100	39	-16	8	8	64	8	8	90	2	10	10
T3	100	47	-23	10	10	72	9	9	70	2	10	10
T3	100	56	-28	14	15	88	11	11	60	2	10	10
T3	100	68	-30	15	15	118	15	15	60	10	40	40
T4	100	68	-24	15	15	64	8	8	42	3	26	26
T4	100	82	-24	18	18	80	10	10	39	3	24	24
T4	100	100	-35	20	20	88	11	11	36	3	24	24
T1	125	2.7	-16	7	8	24	3	3	780	1	2	2
T1	125	3.3	-16	7	8	24	3	3	600	1	2	2
T1	125	3.9	-16	8	8	28	3.5	3.5	557	2	5	5
T2	125	15	-16	7	8	48	6	6	167	1	7	7
T2	125	18	-16	8	8	56	8	8	133	2	10	10
T3	125	39	-16	8	8	64	8	8	90	2	10	10
T3	125	47	-23	10	10	72	9	9	70	2	10	10
T4	125	68	-24	15	15	64	8	8	42	3	26	26
T4	125	82	-24	18	18	80	10	10	39	3	24	24

(1) Measured with category voltage

TABLE 2B (2)

CHARACTERISTICS AT HIGH AND LOW TEMPERATURES

Case Size	UR Rated Voltage	CR Capacitance μF	Capacitance Change %			Maximum Values						
			-55°C	85°C	125°C	TAN δ %			Impedance 120Hz -55°C	Leakage Current (μA)		
						-55°C	20°C	85°C + 125°C		20°C	85°C	125°C (1)
T1	6	30	-40	10	12	80	9	10	100	1	2	2
T1	6	68	-40	14	16	120	15	15	60	1	2	2
T2	6	140	-40	16	16	290	21	21	40	1	3	3
T1	6	160	-42	16	16	328	41	41	80	2	9	9
T2	6	270	-44	17	20	352	45	41	25	1	7	7
T3	6	330	-44	14	16	320	36	36	20	2	8	8
T2	6	560	-68	20	20	850	106	106	48	2	10	10
T3	6	560	-64	18	20	440	55	50	25	2	16	16
T4	6	1200	-80	25	25	720	90	86	20	3	14	14
T3	6	1500	-90	25	25	1376	172	172	36	5	20	20
T4	6	2200	-90	25	25	1360	170	170	22	6	24	24
T1	8	25	-40	10.5	12	60	7.5	6	100	1	2	2
T1	8	56	-40	14	16	112	14	14	59	1	2	2
T1	8	120	-44	17.5	20	300	32	32	80	2	6	6
T2	8	120	-44	17.5	20	160	20	20	50	1	2	2
T2	8	220	-44	16	18	320	40	36	30	1	7	7
T3	8	290	-64	17.5	20	320	34	33	25	2	6	6
T2	8	430	-64	17.5	20	420	64	60	54	2	10	10
T3	8	430	-64	17.5	20	368	46	42	25	2	15	15
T4	8	850	-80	25	25	480	60	56	22	3	16	16
T1	10	20	-32	10.5	12	48	6	6	175	1	2	2
T2	10	100	-36	14	16	120	15	15	60	1	4	4
T3	10	250	-40	14	16	240	30	30	30	2	10	10
T2	10	300	-54	16	18	480	60	60	52	2	10	10
T2	10	350	-60	18	18	544	68	68	52	2	10	10
T3	10	390	-64	18	20	352	44	41	25	2	15	15
T4	10	750	-80	25	25	400	50	46	23	3	16	16
T3	10	850	-84	25	25	888	111	111	36	4	16	16
T1	15	15	-24	10.5	12	40	5	5	155	1	2	2
T1	15	33	-28	14	16	80	10	10	90	1	2	2
T1	15	47	-28	16	16	160	20	20	100	1.5	3	3
T1	15	56	-28	16	16	176	22	22	100	1.5	3	3
T2	15	70	-28	14	16	104	13	13	75	1	4	4
T2	15	120	-28	14	16	200	25	25	50	1	7	7
T3	15	170	-32	14	16	200	25	25	35	2	10	10
T2	15	220	-35	16	16	340	42	42	62	2	10	10
T2	15	270	-45	18	18	440	55	55	60	2	12	12
T3	15	270	-56	18	20	344	43	40	30	2	14	14
T2	15	290	-54	18	18	480	60	60	65	2	12	12
T4	15	540	-80	25	25	320	40	36	23	3	18	18
T3	15	750	-80	25	25	760	95	95	42	6	24	24
T4	15	850	-80	25	25	760	95	95	24	8	32	32
T4	15	1200	-84	25	30	824	103	103	25	8	32	32
T1	25	10	-16	8	9	32	4	4	220	1	2	2
T1	25	43	-28	16	16	144	18	18	120	2	9	9
T2	25	50	-28	13	15	88	11	11	70	1	2	2
T3	25	120	-32	13	15	168	21	21	38	2	6	6
T2	25	160	-35	15	15	290	34	34	60	2	10	10
T3	25	180	-48	14	15	224	28	28	32	2	13	13
T4	25	350	-64	25	25	280	35	32	24	3	20	20
T4	25	850	-80	25	25	760	95	95	26	8	32	32
T1	30	8	-16	8	12	32	4	4	275	1	2	2
T1	30	15	-20	10	12	56	7	7	175	1	2	2
T1	30	25	-24	12	12	81	11	11	160	1.5	3	3
T1	30	33	-30	12	14	104	12	12	160	2	9	9
T2	30	40	-24	10.5	12	96	10	10	65	1	5	5
T2	30	68	-24	13	15	120	15	15	60	1	9	9
T3	30	100	-28	10.5	12	136	17	17	40	2	12	12
T2	30	120	-32	15	15	220	30	30	60	2	10	10
T2	30	150	-35	15	15	270	32	32	60	2	10	10
T3	30	150	-48	14	15	184	23	23	35	2	12	12
T2	30	170	-48	15	15	290	34	34	65	2	12	12
T3	30	300	-60	15	15	368	43	43	44	6	24	24

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