

TCL Series

LOW ESR Tantalum Solid Electrolytic Capacitors Chip Type



FEATURES:

- Lead-Free, ROHS Compliant.
- General purpose surface mount type.
- Compact size & wide CV range.
- High solderability & stable characteristics for soldering.
- Compatible with all popular automatic pick and place equipment.



SPECIFICATION:

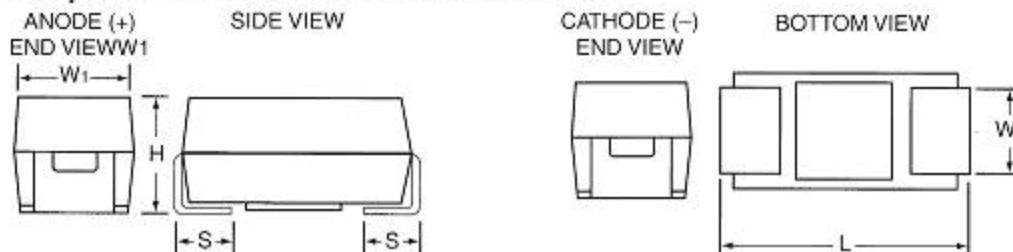
Item	Performance Characteristics									
Operating Temperature Range	-55 to + 125°C									
Rated Working Voltage Range	4 to 50 V DC									
Nominal Capacitance Range	0.1 to 1500 μF									
Capacitance Tolerance	±20% ± 10% (120Hz, +20°C)									
Leakage Current	Not more than 0.01CV [μA] or 0.5μA whichever is greater									
Characteristics at High and Low Temperature	Capacitance (μF)	Capacitance Change(%)			DF Max.(%)				DCL Max.(μF)	
		-55°C	+85°C	+125°C	-55°C	+20°C	+55°C	+125°C	+125°C	+125°C
	≤1.0	-10	+10	+12	6	4	6	6	10L	12L
	1.5~68				10	6	10	10		
	100~680				12	8	12	12		
680~1500	14				10	14	14			
Moisture Resistance	Test conditions									
	Relative humidity : 90 to 95% without load									
	Ambient temperature : +40°C									
	Duration : 500 hours									
	Post test requirements at + 20°C									
	Leakage current : ≤ Initial specified value									
Capacitance change : ± 10% of initial measured value										
tan δ : ≤ Initial specified value										
Endurance	Test conditions									
	Item \ Conditions		Derating				Rating			
	Duration		2000 hours				2000 hours			
	Ambient temperature		+ 125°C				+ 85°C			
	Applied voltage		Derated working voltage				Rated working voltage			
	Source impedance		1Ω/V				1Ω/V			
	Derating Voltage + 125°C for 10~50V working									
	Rated Voltage		4.0	6.3	10.0	16.0	20.0	25.0	35.0	50.0
	Voltage Derating		2.5	4.0	6.3	16.0	13.0	16.0	23.0	33.0
	Surge Voltage+85°C		5.0	8.0	13.0	16.0	26.0	32.0	46.0	65.0
	Surge Voltage+125°C		3.4	5.0	9.0	16.0	16.0	20.0	26.0	38.0
	Post test requirements at +20°C									
	Leakage current : ≤ 125% of initial specified value									
	Capacitance change : ± 10% of initial measured value									
tan δ : ≤ Initial specified value										
Shelf Life	Test conditions									
	Duration : 2000 hours									
	Ambient temperature : +125°C									
	Applied voltage : (none)									
Solder Heat Resistance	Post test requirements at +20°C									
	Same limits for "Endurance".									
Solder Heat Resistance	The capacitor shall withstand dipping into solder bath for 5±1 seconds at 260±5°C									

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1. Tantalum Capacitor CHIP TYPE OUTLINE DRAWINGS.



2. Dimensions Millimeters (Inch)

Case Size	L±0.2(0.008)	W1±0.2(0.008)	H±0.2(0.008)	S±0.2(0.008)	W2±0.2(0.008)
S	2.0(0.079)	1.2(0.049)	1.2(0.047)	0.5(0.020)	1.2(0.047)
A	3.2(0.126)	1.6(0.063)	1.6(0.063)	0.8(0.031)	1.2(0.047)
B	3.5(0.137)	2.8(0.110)	1.9(0.075)	0.8(0.031)	2.2(0.087)
C	6.0(0.236)	3.2(0.126)	2.5(0.098)	1.3(0.051)	2.2(0.087)
D	7.3(0.287)	4.3(0.169)	2.8(0.110)	1.3(0.051)	2.4(0.094)
E	7.3(0.287)	4.3(0.169)	4.0(0.157)	1.3(0.051)	2.4(0.094)
V	7.3(0.287)	6.1(0.240)	3.5(0.135)	1.4(0.055)	3.1(0.120)

3. CAPACITANCE AND RATED VOLTAGE, V (VOLTAGE CODE) RANGE (LETTER DENOTES CASE SIZE)

Rated Voltage(V)	4	6.3	10	16	20	25	35	50
Code	OG	OJ	1A	1C	1D	1E	1V	1H
Capacitance(μF)	Rated Voltage DC(V _R) to 85°C							
0.10 (104)								A(9000)
0.15 (154)								A(9000)
0.22 (224)							A(6000)	A(7000)
0.33 (334)							A(6000)	
0.47 (474)						A(7000)	A(6000)	
0.68 (684)						A(6000)	A(6000)	
1 (105)					A(3000)		A(3000)	C(2500)
1.5 (155)						A(3000)	B(2500)	C(1500,2000)
2.2 (225)			A(1800)	A(1800,3500)	A(3000)	B(900,1200,2500)	A(1500), B(750,1500,2000), C(1000)	D(1200)
3.3 (335)				A(3500)	A(2500)	A(1000,1500)	B(1000)	D(800)
4.7 (475)			A(1400)	A(2000)	B(1300)	B(750,1500,2000)	C(700)	D(300,500,700)
6.8 (685)		A(1800)	A(1800)	A(1500)	B(800,1000)	B(700)	C(350)	D(200,300,500,600)
10 (106)		A(1500)	A(900,1800)	B(500,800), C(500)	B(500,1000)	C(300,500)	D(125,300)	E(400,500)
15 (156)		A(700,1500)	A(1000)	B(500,800)	B(500)	C(220,300)	C(350,450)	E(250)
22 (226)		A(500,900)	B(400,500,700)	B(400,800)	B(400,800)	C(275,400)	D(125,200,300,400)	
33 (336)		A(800)	B(250,350,500,650)	C(150,250,300,375)	C(100,150,400)	D(100,200,300)	E(125,200,300)	
47 (476)	A(500)	B(250,350,500)	C(200,350)	D(110,350)	D(80,100,150,200)	D(125,150,250)	E(200,250)	
68 (686)		B(250,350,500)	B(600)	C(125,200)	D(70,150,200,300)	E(125,200)	V(150,200)	
100 (107)	B(200,250,350,500)	B(250,400)	C(75,100,150,200)	D(60,100,125,150)	D(85,100,150)	V(100)		
150 (157)	B(250)	C(50,90,150,200,250)	D(50,85,100), E(100)	D(60,85,100,125,150)	E(100), V(45,75)			
220 (227)	D(40,50,100)	C(70,100,125,250)	D(50,100,150)	E(100,150)	V(50,75,100,150)			
330 (337)	C(100)	D(45,50,70,100)	E(50,100,125,150)	D(50,65,100,150)	E(40,50,60,100)			
470 (477)	D(45,100)	E(35,45,100)	D(45,60,100,200)	E(45,50,60,100,200)	V(40,60,100)			
680 (687)	D(45,60,100)	E(40,60,100)	V(35,40,50)					
1000 (108)	E(60)	V(25,35,40,50)						
1500 (158)	E(50,75)	V(50,75)						

NOTE: The EIA & CECC standards for low ESR Solid Tantalum Capacitors allow an ESR movement to 1.25 times catalog limit post mounting.

ESR limits quoted in brackets (milliohms)

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EXPLANATION OF PART NUMBERS

TCL Series Code A Case Size 475 Nominal Capacitance M Capacitance Tolerance 016 Rated Voltage T Carrier Tape Packaging R Polarity Orientation 2000 Maximum ESR in Milliohms

RATINGS & PART NUMBER REFERENCE

SONJIU Part No.	Case Size	Capacitance (μF)	DCL (μA) Max.	DF % Max.	ESR Max. (mΩ) @100kHz
4 volt @85°C (10 volt, @125°C)					
TCL A 476(#004TR0500)	A	47	1.9	8	500
TCL B 107(#004TR0200)	B	100	4	8	200
TCL B 107(#004TR0250)	B	100	4	8	250
TCL B 107(#004TR0350)	B	100	4	8	350
TCL B 107(#004TR0500)	B	100	4	8	500
TCL B 157(#004TR0250)	B	150	6	10	250
TCL C 157(#004TR0070)	C	150	6	6	70
TCL C 157(#004TR0080)	C	150	6	6	80
TCL D 227(#004TR0040)	D	220	8.8	8	40
TCL D 227(#004TR0050)	D	220	8.8	8	50
TCL D 227(#004TR0100)	D	220	8.8	8	100
TCL C 337(#004TR0100)	C	330	13.2	8	100
TCL D 337(#004TR0035)	D	330	13.2	8	35
TCL D 337(#004TR0045)	D	330	13.2	8	45
TCL D 337(#004TR0100)	D	330	13.2	8	100
TCL D 477(#004TR0045)	D	470	18.8	12	45
TCL D 477(#004TR0100)	D	470	18.8	12	100
TCL E 477(#004TR0035)	E	470	18.8	12	35
TCL E 477(#004TR0045)	E	470	18.8	12	45
TCL E 477(#004TR0100)	E	470	18.8	12	100
TCL D 687(#004TR0045)	D	680	27.2	14	45
TCL D 687(#004TR0060)	D	680	27.2	14	60
TCL D 687(#004TR0100)	D	680	27.2	14	100
TCL E 687(#004TR0040)	E	680	27.2	10	40
TCL E 687(#004TR0060)	E	680	27.2	10	60
TCL E 687(#004TR0100)	E	680	27.2	10	100
TCL E 108(#004TR0060)	E	1000	40	14	60
TCL V 108(#004TR0025)	V	1000	40	16	25
TCL V 108(#004TR0035)	V	1000	40	16	35
TCL V 108(#004TR0040)	V	1000	40	16	40
TCL V 108(#004TR0050)	V	1000	40	16	50
TCL E 158(#004TR0050)	E	1500	60	30	50
TCL E 158(#004TR0075)	E	1500	60	30	75
TCL V 158(#004TR0050)	V	1500	60	30	50
TCL V 158(#004TR0075)	V	1500	60	30	75
6 volt @85°C (10 volt, @125°C)					
TCL A 685(#006TR1800)	A	6.8	0.5	6	1800
TCL A 106(#006TR1500)	A	10	0.6	6	1500
TCL A 156(#006TR0700)	A	15	0.9	6	700
TCL A 156(#006TR1500)	A	15	0.9	6	1500
TCL A 226(#006TR0500)	A	22	1.4	6	500
TCL A 226(#006TR0900)	A	22	1.4	6	900
TCL B 226(#006TR0375)	B	22	1.4	6	375
TCL B 226(#006TR0600)	B	22	1.4	6	600
TCL A 336(#006TR0600)	A	33	2.1	8	600
TCL B 336(#006TR0250)	B	33	2.1	6	250
TCL B 336(#006TR0350)	B	33	2.1	6	350
TCL B 336(#006TR0450)	B	33	2.1	6	450
TCL B 336(#006TR0600)	B	33	2.1	6	600
TCL A 476(#006TR0800)	A	47	2.8	10	800
TCL B 476(#006TR0250)	B	47	3.0	6	250
TCL B 476(#006TR0350)	B	47	3.0	6	350
TCL B 476(#006TR0500)	B	47	3.0	6	500
TCL C 476(#006TR0300)	C	47	3.0	6	300
TCL B 686(#006TR0250)	B	68	4.3	8	250
TCL B 686(#006TR0350)	B	68	4.3	8	350
TCL B 686(#006TR0500)	B	68	4.3	8	500
TCL C 686(#006TR0150)	C	68	4.3	6	150
TCL C 686(#006TR0200)	C	68	4.3	6	200
TCL B 107(#006TR0250)	B	100	6.3	10	250
TCL B 107(#006TR0400)	B	100	6.3	10	400
TCL C 107(#006TR0075)	C	100	6.3	6	75

SONJIU Part No.	Case Size	Capacitance (μF)	DCL (μA) Max.	DF % Max.	ESR Max. (mΩ) @100kHz
10 volt @85°C (10 volt, @125°C)					
TCL C 107(#006TR0150)	C	100	6.3	6	150
TCL C 157(#006TR0050)	C	150	9.5	6	50
TCL C 157(#006TR0090)	C	150	9.5	6	90
TCL C 157(#006TR0150)	C	150	9.5	6	150
TCL C 157(#006TR0200)	C	150	9.5	6	200
TCL C 157(#006TR0250)	C	150	9.5	6	250
TCL D 157(#006TR0050)	D	150	9.5	6	50
TCL D 157(#006TR0125)	D	150	9.5	6	125
TCL C 227(#006TR0070)	C	220	13.9	8	70
TCL C 227(#006TR0100)	C	220	13.9	8	100
TCL C 227(#006TR0125)	C	220	13.9	8	125
TCL C 227(#006TR0250)	C	220	13.9	8	250
TCL D 227(#006TR0050)	D	220	13.9	8	50
TCL D 227(#006TR0100)	D	220	13.2	8	100
TCL D 227(#006TR0125)	D	220	13.9	8	125
TCL E 227(#006TR0100)	E	220	13.2	8	100
TCL D 337(#006TR0045)	D	330	20.8	8	45
TCL D 337(#006TR0050)	D	330	20.8	8	50
TCL D 337(#006TR0070)	D	330	20.8	8	70
TCL D 337(#006TR0100)	D	330	20.8	8	100
TCL E 337(#006TR0050)	E	330	20.8	8	50
TCL E 337(#006TR0100)	E	330	20.8	8	100
TCL E 337(#006TR0125)	E	330	20.8	8	125
TCL E 337(#006TR0150)	E	330	20.8	8	150
TCL V 337(#006TR0100)	V	330	20.8	8	100
TCL D 477(#006TR0045)	D	470	29.6	12	45
TCL D 477(#006TR0060)	D	470	29.6	12	60
TCL D 477(#006TR0100)	D	470	29.6	12	100
TCL D 477(#006TR0200)	D	470	29.6	12	200
TCL E 477(#006TR0045)	E	470	29.6	10	45
TCL E 477(#006TR0050)	E	470	29.6	10	50
TCL E 477(#006TR0060)	E	470	29.6	10	60
TCL E 477(#006TR0100)	E	470	29.6	10	100
TCL E 477(#006TR0200)	E	470	29.6	10	200
TCL V 477(#006TR0040)	V	470	29.6	10	40
TCL V 477(#006TR0055)	V	470	29.6	10	55
TCL V 477(#006TR0100)	V	470	29.6	10	100
TCL E 687(#006TR0045)	E	680	42.8	10	45
TCL E 687(#006TR0060)	E	680	42.8	10	60
TCL E 687(#006TR0100)	E	680	42.8	10	100
TCL V 687(#006TR0035)	V	680	42.8	14	35
TCL V 687(#006TR0040)	V	680	42.8	10	40
TCL V 687(#006TR0050)	V	680	42.8	10	50
TCL V 108(#006TR0040)	V	1000	60	16	40
TCL V 108(#006TR0050)	V	1000	60	16	50
10 volt @85°C (10 volt, @125°C)					
TCL A 225(#010TR1800)	A	2.2	0.5	6	1800
TCL A 475(#010TR1400)	A	4.7	0.5	6	1400
TCL A 685(#010TR1800)	A	6.8	0.7	6	1800
TCL A 106(#010TR0900)	A	10	1	6	900
TCL A 106(#010TR1800)	A	10	1	6	1800
TCL A 156(#010TR1000)	A	15	1.5	6	1000
TCL B 156(#010TR0450)	B	15	1.5	6	450
TCL B 156(#010TR0600)	B	15	1.5	6	600
TCL B 226(#010TR0400)	B	22	2.2	6	400
TCL B 226(#010TR0500)	B	22	2.2	6	500
TCL B 226(#010TR0700)	B	22	2.2	6	700
TCL C 226(#010TR0300)	C	22	2.2	6	300
TCL B 336(#010TR0250)	B	33	3.3	6	250
TCL B 336(#010TR0425)	B	33	3.3	6	425
TCL B 336(#010TR0500)	B	33	3.3	6	500
TCL B 336(#010TR0650)	B	33	3.3	6	650
TCL C 336(#010TR0150)	C	33	3.3	6	150
TCL C 336(#010TR0375)	C	33	3.3	6	375

All technical data relates to an ambient temperature of +25°C.
 Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts. DCL is measured at rated voltage after 5 minutes.
 # For 10% tolerance, insert, "K" in (#) above.
 For 20% tolerance, insert, "M" in (#) above.

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RATINGS & PART NUMBER REFERENCE

SONJIU Part No.	Case Size	Capacitance (μF)	DCL (μA) Max.	DF % Max.	ESR Max. (mΩ) @100kHz
10 volt @85°C (10 volt @125°C)					
TCL C 336(010TR0500)	C	33	3.3	6	500
TCL B 476(010TR0250)	B	47	4.7	8	250
TCL B 476(010TR0350)	B	47	4.7	8	350
TCL B 476(010TR0500)	B	47	4.7	8	500
TCL B 476(010TR0650)	B	47	4.7	8	650
TCL C 476(010TR0200)	C	47	4.7	6	200
TCL C 476(010TR0350)	C	47	4.7	6	350
TCL D 476(010TR0100)	D	47	4.7	6	100
TCL B 686(010TR0600)	B	68	6.8	8	600
TCL C 686(010TR0080)	C	68	6.8	6	80
TCL C 686(010TR0100)	C	68	6.8	6	100
TCL C 686(010TR0200)	C	68	6.8	6	200
TCL C 686(010TR0300)	C	68	6.8	6	300
TCL D 686(010TR0100)	D	68	6.8	6	100
TCL D 686(010TR0150)	D	68	6.8	6	150
TCL B 107(010TR0400)	B	100	10	8	400
TCL C 107(010TR0075)	C	100	10	8	75
TCL C 107(010TR0100)	C	100	10	8	100
TCL C 107(010TR0150)	C	100	10	8	150
TCL C 107(010TR0200)	C	100	10	8	200
TCL D 107(010TR0050)	D	100	10	6	50
TCL D 107(010TR0065)	D	100	10	6	65
TCL D 107(010TR0080)	D	100	10	6	80
TCL D 107(010TR0100)	D	100	10	6	100
TCL D 107(010TR0125)	D	100	10	6	125
TCL D 107(010TR0150)	D	100	10	6	150
TCL E 107(010TR0125)	E	100	10	6	125
TCL D 157(010TR0050)	D	150	15	6	50
TCL D 157(010TR0085)	D	150	15	8	85
TCL D 157(010TR0100)	D	150	15	8	100
TCL E 157(010TR0100)	E	150	15	8	100
TCL D 227(010TR0050)	D	220	22	8	50
TCL D 227(010TR0100)	D	220	22	8	100
TCL D 227(010TR0150)	D	220	22	8	150
TCL E 227(010TR0050)	E	220	22	8	50
TCL E 227(010TR0060)	E	220	22	8	60
TCL E 227(010TR0070)	E	220	22	8	70
TCL E 227(010TR0100)	E	220	22	8	100
TCL E 227(010TR0125)	E	220	22	8	125
TCL E 227(010TR0150)	E	220	22	8	150
TCL D 337(010TR0050)	D	330	33	8	50
TCL D 337(010TR0065)	D	330	33	8	65
TCL D 337(010TR0100)	D	330	33	8	100
TCL D 337(010TR0150)	D	330	33	8	150
TCL E 337(010TR0040)	E	330	33	8	40
TCL E 337(010TR0050)	E	330	33	8	50
TCL E 337(010TR0060)	E	330	33	8	60
TCL E 337(010TR0100)	E	330	33	8	100
TCL V 337(010TR0040)	V	330	33	10	40
TCL V 337(010TR0060)	V	330	33	10	60
TCL V 337(010TR0100)	V	330	33	10	100
TCL E 477(010TR0045)	E	470	47	10	45
TCL E 477(010TR0050)	E	470	47	10	50
TCL E 477(010TR0060)	E	470	47	10	60
TCL E 477(010TR0100)	E	470	47	10	100
TCL E 477(010TR0200)	E	470	47	10	200
TCL V 477(010TR0040)	V	470	47	10	40
TCL V 477(010TR0060)	V	470	47	10	60
TCL V 477(010TR0100)	V	470	47	10	100
16 volt @85°C (10 volt @125°C)					
TCL A 225(016TR1800)	A	2.2	0.5	6	1800
TCL A 225(016TR3500)	A	2.2	0.5	6	3500
TCL A 335(016TR3500)	A	3.3	0.5	6	3500
TCL A 475(016TR2000)	A	4.7	0.8	6	2000
TCL B 475(016TR0800)	B	4.7	0.8	6	800
TCL B 475(016TR1500)	B	4.7	0.8	6	1500
TCL A 685(016TR1500)	A	6.8	1.1	6	1500
TCL B 685(016TR0600)	B	6.8	1.1	6	600
TCL B 685(016TR1200)	B	6.8	1.1	6	1200
TCL B 106(016TR0500)	B	10	1.6	6	500
TCL B 106(016TR0800)	B	10	1.6	6	800
TCL C 106(016TR0500)	C	10	1.6	6	500
TCL B 156(016TR0500)	B	15	2.4	6	500
TCL B 156(016TR0800)	B	15	2.4	6	800
TCL B 226(016TR0400)	B	22	3.5	6	400
TCL B 226(016TR0600)	B	22	3.5	6	600

SONJIU Part No.	Case Size	Capacitance (μF)	DCL (μA) Max.	DF % Max.	ESR Max. (mΩ) @100kHz
20 volt @85°C (10 volt @125°C)					
TCL C 226(016TR0150)	C	22	3.5	6	150
TCL C 226(016TR0250)	C	22	3.5	6	250
TCL C 226(016TR0300)	C	22	3.5	6	300
TCL C 226(016TR0375)	C	22	3.5	6	375
TCL B 336(016TR0350)	B	33	5.3	8	350
TCL B 336(016TR0500)	B	33	5.3	8	500
TCL C 336(016TR0100)	C	33	5.3	6	100
TCL C 336(016TR0150)	C	33	5.3	6	150
TCL C 336(016TR0225)	C	33	5.3	6	225
TCL C 336(016TR0300)	C	33	5.3	6	300
TCL D 336(016TR0200)	D	33	5.3	6	200
TCL C 476(016TR0110)	C	47	7.5	6	110
TCL C 476(016TR0350)	C	47	7.5	6	350
TCL D 476(016TR0080)	D	47	7.5	6	80
TCL D 476(016TR0100)	D	47	7.5	6	100
TCL D 476(016TR0150)	D	47	7.5	6	150
TCL D 476(016TR0200)	D	47	7.5	6	200
TCL C 686(016TR0125)	C	68	10.9	6	125
TCL C 686(016TR0200)	C	68	10.9	6	200
TCL D 686(016TR0070)	D	68	10.9	6	70
TCL D 686(016TR0100)	D	68	10.9	6	100
TCL D 686(016TR0150)	D	68	10.9	6	150
TCL D 107(016TR0060)	D	100	16	6	60
TCL D 107(016TR0100)	D	100	16	6	100
TCL D 107(016TR0125)	D	100	16	6	125
TCL D 107(016TR0150)	D	100	16	6	150
TCL E 107(016TR0055)	E	100	16	6	55
TCL E 107(016TR0100)	E	100	16	6	100
TCL E 107(016TR0125)	E	100	16	6	125
TCL E 107(016TR0150)	E	100	16	6	150
TCL D 157(016TR0060)	D	150	24	6	60
TCL D 157(016TR0085)	D	150	24	6	85
TCL D 157(016TR0100)	D	150	24	6	100
TCL D 157(016TR0125)	D	150	24	6	125
TCL D 157(016TR0150)	D	150	24	6	150
TCL E 157(016TR0100)	E	150	24	6	100
TCL V 157(016TR0045)	V	150	24	8	45
TCL V 157(016TR0075)	V	150	24	8	75
TCL E 227(016TR0100)	E	220	35.2	10	100
TCL E 227(016TR0150)	E	220	35.2	10	150
TCL V 227(016TR0050)	V	220	35.2	8	50
TCL V 227(016TR0075)	V	220	35.2	8	75
TCL V 227(016TR0100)	V	220	35.2	8	100
TCL V 227(016TR0150)	V	220	35.2	8	150
20 volt @85°C (10 volt @125°C)					
TCL A 105(020TR3000)	A	1	0.5	4	3000
TCL A 225(020TR3000)	A	2.2	0.5	6	3000
TCL A 335(020TR2500)	A	3.3	0.7	6	2500
TCL B 335(020TR1300)	B	3.3	0.7	6	1300
TCL A 475(020TR1800)	A	4.7	0.9	6	1800
TCL B 475(020TR0750)	B	4.7	0.9	6	750
TCL B 475(020TR1000)	B	4.7	0.9	6	1000
TCL A 685(020TR1000)	A	6.8	1.4	6	1000
TCL B 685(020TR0600)	B	6.8	1.4	6	600
TCL B 685(020TR1000)	B	6.8	1.4	6	1000
TCL C 685(020TR0700)	C	6.8	1.4	6	700
TCL B 106(020TR0500)	B	10	2	6	500
TCL B 106(020TR1000)	B	10	2	6	1000
TCL C 106(020TR0500)	C	10	2	6	500
TCL C 106(020TR0700)	C	10	2	6	700
TCL B 156(020TR0500)	B	15	3	6	500
TCL C 156(020TR0400)	C	15	3	6	400
TCL C 156(020TR0450)	C	15	3	6	450
TCL B 226(020TR0400)	B	22	4.4	6	400
TCL B 226(020TR0600)	B	22	4.4	6	600
TCL C 226(020TR0100)	C	22	4.4	6	100
TCL C 226(020TR0150)	C	22	4.4	6	150
TCL C 226(020TR0400)	C	22	4.4	6	400
TCL D 226(020TR0200)	D	22	4.4	6	200
TCL D 226(020TR0300)	D	22	4.4	6	300
TCL C 336(020TR0300)	C	33	6.6	6	300
TCL D 336(020TR0100)	D	33	6.6	6	100
TCL D 336(020TR0200)	D	33	6.6	6	200
TCL D 476(020TR0075)	D	47	9.4	6	75
TCL D 476(020TR0100)	D	47	9.4	6	100

All technical data relates to an ambient temperature of +25°C.
Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts. DCL is measured at rated voltage after 5 minutes.
For 10% tolerance, insert, "K" in (#) above. For 20% tolerance, insert, "M" in (#) above.

TCL Series

Low ESR Tantalum Solid Electrolytic Capacitors Chip Type



RATINGS & PART NUMBER REFERENCE

SONJUI Part No.	Case Size	Capacitance (μF)	DCL (μA) Max.	DF % Max.	ESR Max. (mΩ) @100kHz
20 volt @85°C (10 volt @125°C)					
TCL D 476(μ)020TR0200	D	47	9.4	6	200
TCL E 476(μ)020TR0070	E	47	9.4	6	70
TCL E 476(μ)020TR0125	E	47	9.4	6	125
TCL E 476(μ)020TR0150	E	47	9.4	6	150
TCL E 476(μ)020TR0200	E	47	9.4	6	200
TCL E 476(μ)020TR0250	E	47	9.4	6	250
TCL D 686(μ)020TR0070	D	68	13.6	6	70
TCL D 686(μ)020TR0150	D	68	13.6	6	150
TCL D 686(μ)020TR0200	D	68	13.6	6	200
TCL D 686(μ)020TR0300	D	68	13.6	6	300
TCL E 686(μ)020TR0125	E	68	13.6	6	125
TCL E 686(μ)020TR0150	E	68	13.6	6	150
TCL E 686(μ)020TR0200	E	68	13.6	6	200
TCL D 107(μ)020TR0085	D	100	20	6	85
TCL D 107(μ)020TR0100	D	100	20	6	100
TCL D 107(μ)020TR0150	D	100	20	6	150
TCL E 107(μ)020TR0100	E	100	20	6	100
TCL E 107(μ)020TR0150	E	100	20	6	150
TCL E 107(μ)020TR0200	E	100	20	6	200
TCL V 107(μ)020TR0060	V	100	20	8	60
TCL V 107(μ)020TR0085	V	100	20	8	85
TCL V 107(μ)020TR0100	V	100	20	8	100
TCL V 107(μ)020TR0200	V	100	20	8	200
TCL V 157(μ)020TR0080	V	150	30	8	80
25 volt @85°C (10 volt @125°C)					
TCL A 474(μ)025TR7000	A	0.47	0.5	4	7000
TCL A 684(μ)025TR6000	A	0.68	0.5	4	6000
TCL A 155(μ)025TR3000	A	1.5	0.5	6	3000
TCL B 155(μ)025TR1800	B	1.5	0.5	6	1800
TCL B 225(μ)025TR0900	B	2.2	0.6	6	900
TCL B 225(μ)025TR1200	B	2.2	0.6	6	1200
TCL B 225(μ)025TR2500	B	2.2	0.6	6	2500
TCL A 335(μ)025TR1000	A	3.3	0.8	6	1000
TCL A 335(μ)025TR1500	A	3.3	0.8	6	1500
TCL B 335(μ)025TR0750	B	3.3	0.8	6	750
TCL B 335(μ)025TR1500	B	3.3	0.8	6	1500
TCL B 335(μ)025TR2000	B	3.3	0.8	6	2000
TCL B 475(μ)025TR0700	B	4.7	1.2	6	700
TCL B 475(μ)025TR0900	B	4.7	1.2	6	900
TCL B 475(μ)025TR1500	B	4.7	1.2	6	1500
TCL B 685(μ)025TR0700	B	6.8	1.7	6	700
TCL C 685(μ)025TR0500	C	6.8	1.7	6	500
TCL C 685(μ)025TR0600	C	6.8	1.7	6	600
TCL C 685(μ)025TR0700	C	6.8	1.7	6	700
TCL C 106(μ)025TR0300	C	10	2.5	6	300
TCL C 106(μ)025TR0500	C	10	2.5	6	500
TCL C 156(μ)025TR0220	C	15	3.8	6	220
TCL C 156(μ)025TR0300	C	15	3.8	6	300
TCL D 156(μ)025TR0100	D	15	3.8	6	100
TCL D 156(μ)025TR0300	D	15	3.8	6	300
TCL C 226(μ)025TR0275	C	22	5.5	6	275
TCL C 226(μ)025TR0400	C	22	5.5	6	400
TCL D 226(μ)025TR0100	D	22	5.5	6	100
TCL D 226(μ)025TR0200	D	22	5.5	6	200
TCL D 226(μ)025TR0300	D	22	5.5	6	300
TCL D 336(μ)025TR0100	D	33	8.3	6	100
TCL D 336(μ)025TR0200	D	33	8.3	6	200
TCL D 336(μ)025TR0300	D	33	8.3	6	300
TCL E 336(μ)025TR0100	E	33	8.3	6	100
TCL E 336(μ)025TR0175	E	33	8.3	6	175
TCL E 336(μ)025TR0200	E	33	8.3	6	200
TCL E 336(μ)025TR0300	E	33	8.3	6	300
TCL D 476(μ)025TR0125	D	47	11.8	6	125
TCL D 476(μ)025TR0150	D	47	11.8	6	150
TCL D 476(μ)025TR0250	D	47	11.8	6	250
TCL E 476(μ)025TR0080	E	47	8.3	6	80
TCL E 476(μ)025TR0100	E	47	8.3	6	100
TCL E 476(μ)025TR0125	E	47	8.3	6	125
TCL E 686(μ)025TR0125	E	68	17	6	125
TCL E 686(μ)025TR0200	E	68	17	6	200
TCL V 686(μ)025TR0080	V	68	17	6	80
TCL V 686(μ)025TR0095	V	68	17	6	95
TCL V 686(μ)025TR0150	V	68	17	6	150
TCL V 686(μ)025TR0200	V	68	17	6	200
TCL V 107(μ)025TR0100	V	100	25	8	100

SONJUI Part No.	Case Size	Capacitance (μF)	DCL (μA) Max.	DF % Max.	ESR Max. (mΩ) @100kHz
35 volt @85°C (10 volt @125°C)					
TCL A 224(μ)035TR6000	A	0.22	0.5	4	6000
TCL A 334(μ)035TR6000	A	0.33	0.5	4	6000
TCL A 474(μ)035TR6000	A	0.47	0.5	4	6000
TCL B 474(μ)035TR4000	B	0.47	0.5	4	4000
TCL A 684(μ)035TR6000	A	0.68	0.5	4	6000
TCL A 105(μ)035TR3000	A	1	0.5	4	3000
TCL B 105(μ)035TR2000	B	1	0.5	4	2000
TCL B 155(μ)035TR2500	B	1.5	0.5	6	2500
TCL A 225(μ)035TR1500	A	2.2	0.8	6	1500
TCL B 225(μ)035TR0750	B	2.2	0.8	6	750
TCL B 225(μ)035TR1500	B	2.2	0.8	6	1500
TCL B 225(μ)035TR2000	B	2.2	0.8	6	2000
TCL C 225(μ)035TR1000	C	2.2	0.8	6	1000
TCL B 335(μ)035TR1000	B	3.3	1.2	6	1000
TCL C 335(μ)035TR0700	C	3.3	1.2	6	700
TCL B 475(μ)035TR0700	B	4.7	1.2	6	700
TCL B 475(μ)035TR1500	B	4.7	1.2	6	1500
TCL C 475(μ)035TR0600	C	4.7	1.6	6	600
TCL C 685(μ)035TR0350	C	6.8	2.4	6	350
TCL D 685(μ)035TR0150	D	6.8	2.4	6	150
TCL D 685(μ)035TR0400	D	6.8	2.4	6	400
TCL D 685(μ)035TR0500	D	6.8	2.4	6	500
TCL D 106(μ)035TR0125	D	10	3.5	6	125
TCL D 106(μ)035TR0300	D	10	3.5	6	300
TCL E 106(μ)035TR0200	E	10	3.5	6	200
TCL C 156(μ)035TR0350	C	15	5.3	6	350
TCL C 156(μ)035TR0450	C	15	5.3	6	450
TCL D 156(μ)035TR0100	D	15	5.3	6	100
TCL D 156(μ)035TR0300	D	15	5.3	6	300
TCL D 226(μ)035TR0125	D	22	7.7	6	125
TCL D 226(μ)035TR0200	D	22	7.7	6	200
TCL D 226(μ)035TR0300	D	22	7.7	6	300
TCL D 226(μ)035TR0400	D	22	7.7	6	400
TCL E 226(μ)035TR0125	E	22	7.7	6	125
TCL E 226(μ)035TR0200	E	22	7.7	6	200
TCL E 226(μ)035TR0300	E	22	7.7	6	300
TCL D 336(μ)035TR0200	D	33	11.6	6	200
TCL D 336(μ)035TR0300	D	33	11.6	6	300
TCL E 336(μ)035TR0100	E	33	11.6	6	100
TCL E 336(μ)035TR0250	E	33	11.6	6	250
TCL E 336(μ)035TR0300	E	33	11.6	6	300
TCL V 336(μ)035TR0200	V	33	11.6	6	200
TCL E 476(μ)035TR0200	E	47	16.5	6	200
TCL E 476(μ)035TR0250	E	47	16.5	6	250
TCL V 476(μ)035TR0150	V	47	16.5	6	150
TCL V 476(μ)035TR0200	V	47	16.5	6	200
TCL V 686(μ)035TR0150	V	68	23.8	6	150
TCL V 686(μ)035TR0200	V	68	23.8	6	200
50 volt @85°C (10 volt @125°C)					
TCL A 154(μ)050TR9000	A	0.15	0.5	4	9000
TCL A 224(μ)050TR7000	A	0.22	0.5	4	7000
TCL C 105(μ)050TR2500	C	1	0.5	4	2500
TCL C 155(μ)050TR1500	C	1.5	0.8	6	1500
TCL C 155(μ)050TR2000	C	1.5	0.8	6	2000
TCL D 225(μ)050TR1200	D	2.2	1.1	6	1200
TCL D 335(μ)050TR0800	D	3.3	1.7	6	800
TCL D 475(μ)050TR0300	D	4.7	2.4	6	300
TCL D 475(μ)050TR0500	D	4.7	2.4	6	500
TCL D 475(μ)050TR0700	D	4.7	2.4	6	700
TCL D 685(μ)050TR0200	D	6.8	3.4	6	200
TCL D 685(μ)050TR0300	D	6.8	3.4	6	300
TCL D 685(μ)050TR0500	D	6.8	3.4	6	500
TCL D 685(μ)050TR0600	D	6.8	3.4	6	600
TCL E 106(μ)050TR0400	E	10	5	6	400
TCL E 106(μ)050TR0500	E	10	5	6	500
TCL E 156(μ)050TR0250	E	15	5	6	250

All technical data relates to an ambient temperature of +25°C.
 Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts. DCL is measured at rated voltage after 5 minutes.
 # For 10% tolerance, insert, "K" in (#) above.
 For 20% tolerance, insert, "M" in (#) above.

TCL Series

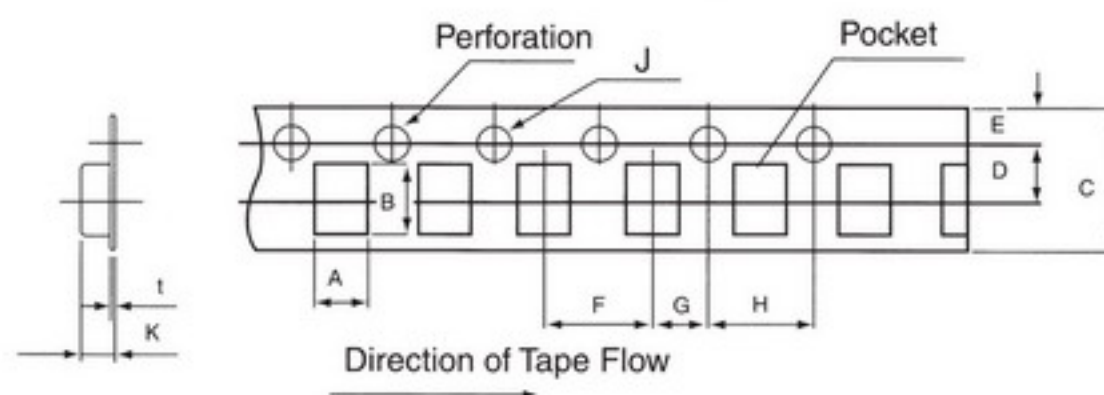
LOW ESR Tantalum Solid Electrolytic Capacitors Chip Type



CARRIER TAPE PACKAGING SPECIFICATIONS

Dimensions of the carrier tape and standard parts quantity per reel.

Dimensions



(Unit:mm)

CASE SIZE	A ±0.1	B ±0.1	C ±0.3	D ±0.1	E ±0.1	F ±0.1	G ±0.1	H ±0.1	J +0.1 -0	K MAX	t	Quantity Per Reel
S	1.6	2.4	8.0	3.5	1.75	4.0	2.0	4.0	1.5	2.5	0.2	2000
A	1.9	3.5	8.0	3.5	1.75	4.0	2.0	4.0	1.5	2.5	0.2	2000
B	3.1	3.8	8.0	3.5	1.75	4.0	2.0	4.0	1.5	2.5	0.2	2000
C	3.6	6.4	12.0	5.5	1.75	8.0	2.0	4.0	1.5	3.0	0.3	500
D	4.7	7.7	12.0	5.5	1.75	8.0	2.0	4.0	1.5	3.4	0.3	500
E	4.6	7.6	12.0	5.5	1.75	8.0	2.0	4.0	1.5	4.6	0.3	400
V	6.4	7.4	12.0	5.5	1.75	8.0	2.0	4.0	1.5	3.8	0.3	400

Inserting Direction (Polarity Orientation)

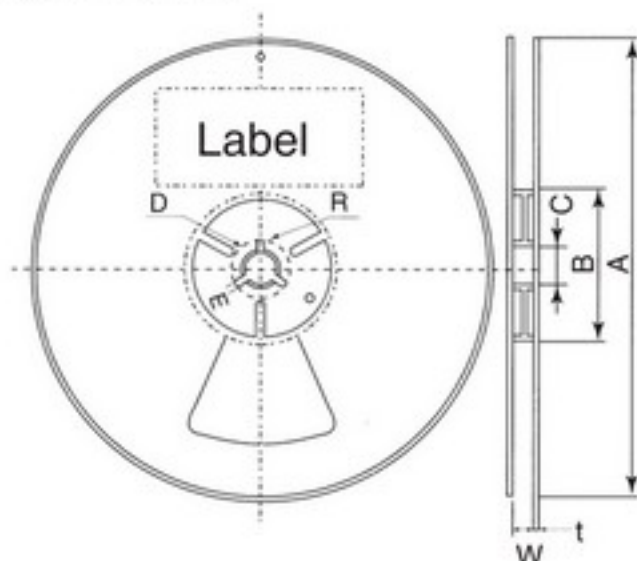
Polarity L: To be inserted with the positive side to the feed hole.



Polarity R: To be inserted with the negative side to the feed hole.



Reel Dimensions



(Unit:mm)

Tape width	8	12
A ₃ ⁰	ø 180	←
B ₀ ⁺¹	ø 60	←
C ± 0.2	ø 13	←
D ± 0.8	ø 21	←
E ± 0.5	2.0	←
W ± 0.3	9.0	13.0
t ± 0.4	1.3	←
R ± 0.4	10.5	←

Tape Leader and Tailer

