

TANTALUM ELECTROLYTIC CAPACITORS

TNC Series (High Performance Polymer type Chip Tantalum Capacitors)

Features

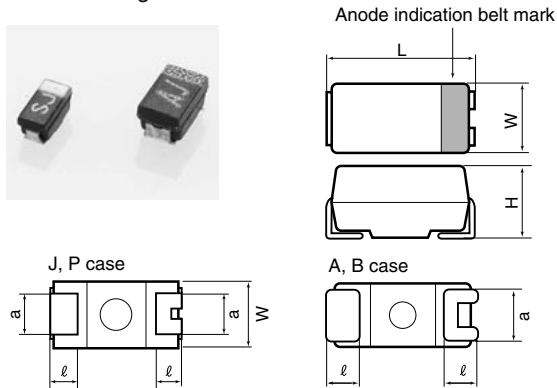
- This type reduces ESR by using high performance polymer based on our original manufacturing process.
- This type is most suitable for an output smoothing circuit that is used, for example, in a DC-DC converter requiring a small size, large capacitance, and low ESR.

Product code: (Example) TMCN type A case 6.3 V 10 $\mu\text{F} \pm 20\%$

TNC A 0J 106 M T R F

Type of series: TNC
Case size code: A
Rated voltage code: F
Capacitance code: 106
Capacitance tolerance code: M
With or without taping: T
Packing polarity code: R
Lead-free solder plating: F

Outline of drawings and dimensions



Dimensions

(Unit : mm)

Case code	Case size				
	L	W	H	ℓ	a
J	1.6 ± 0.1	0.8 ± 0.1	0.8 ± 0.1	0.3 ± 0.15	0.6 ± 0.1
P	2.0 ± 0.2	1.25 ± 0.2	1.2 ^{MAX}	0.5 ± 0.2	0.9 ± 0.1
A	3.2 ± 0.2	1.6 ± 0.2	1.6 ± 0.2	0.7 ± 0.3	1.2 ± 0.2
B	3.5 ± 0.2	2.8 ± 0.2	1.9 ± 0.2	0.8 ± 0.3	2.2 ± 0.2
UB	3.5 ± 0.2	2.8 ± 0.2	1.2 ^{MAX}	0.8 ± 0.3	2.2 ± 0.2

Standard value and case size

Capacitance	Rated voltage (V.DC)			
	4	6.3	10	
μF	Code	0G	0J	1A
3.3	335		J,P	J,P
4.7	475		J,P,A	J,P,A
6.8	685		J,P,A	
10	106	J,P,A	P,A	A
15	156	P,A	A	A
22	226	A,B	A	UB,B
33	336	A,B	A,UB,B	UB,B
47	476	A,UB,B	UB,B	B
68	686	UB,B	B	
100	107	UB,B	B	
150	157	B		

For ratings not covered the table, consult Hitachi AIC.

Product specifications	TNC	Test conditions JIS C5101-3-1998
Operating temperature range	-55°C ~ +105°C	
Rated voltage	DC4 ~ 10V	85°C
Surge voltage	DC5V ~ 13V	85°C
Derated voltage	DC2.5 ~ 6.3V	(105°C)
Capacitance	3.3 ~ 150 μF	120Hz
Capacitance tolerance	$\pm 20\%$	120Hz
Leakage current	Refer to table standard product table	—
tan δ	0.1 or less	120Hz
ESR (100kHz)	J case 500m Ω ^{MAX} P case 200m Ω , 500m Ω ^{MAX} A case 200m Ω , 500m Ω ^{MAX} UB case 70, 200m Ω ^{MAX} B case 45 ~ 200m Ω ^{MAX}	100kHz
Maximum permissible ripple current (100kHz, 20°C)	J case 320mArms ^{MAX} P case 360, 560mArms ^{MAX} A case 400, 620mArms ^{MAX} UB case 590, 1000mArms ^{MAX} B case 700 ~ 1460mArms ^{MAX}	100kHz
Surge withstanding voltage	Δ C/C $\pm 20\%$ or less tan δ Specified initial value or less LC Specified initial value or less	Charge a surge voltage through a protective resistor of 33 Ω for 30 seconds and discharge it for 5 minutes and 30 seconds at 85°C. Repeat this operation 1000 times.
Temperature characteristics	Specified initial value Δ C/C - -20 ~ 0% 0 ~ +30% tan δ 0.10 0.14 - LC Refer to standard product table	Measure the specified characteristics in each stage.
Solder heat resistance	Δ C/C $\pm 10\%$ or less tan δ Specified initial value or less LC 300% or less Specified initial value or less	Reflow Board surface peak temperature: 240 \pm 5°C 200°C or more: within 20 sec.
Moisture resistance no load	Δ C/C +30% ~ -20% or less tan δ Specified initial value or less LC 300% or less Specified initial value or less	Leave at 40°C and 90 to 95%RH for 500 hours.
High-temperature load	Δ C/C $\pm 20\%$ or less tan δ Specified initial value or less LC 300% or less Specified initial value or less	85°C. The rated voltage is applied through a protective resistor of 1 Ω for 1000 hours.
Thermal shock	Δ C/C $\pm 20\%$ or less tan δ Specified initial value or less LC 300% or less Specified initial value or less	Leave at -55°C, normal temperature, 85°C, and normal temperature for 30 min., 15 min., 30 min., and 15 min. Repeat this operation 5 times running.
Failure rate	1% / 1000hrs	85°C. The rated voltage is applied (through a protective resistor of 1 Ω /V).

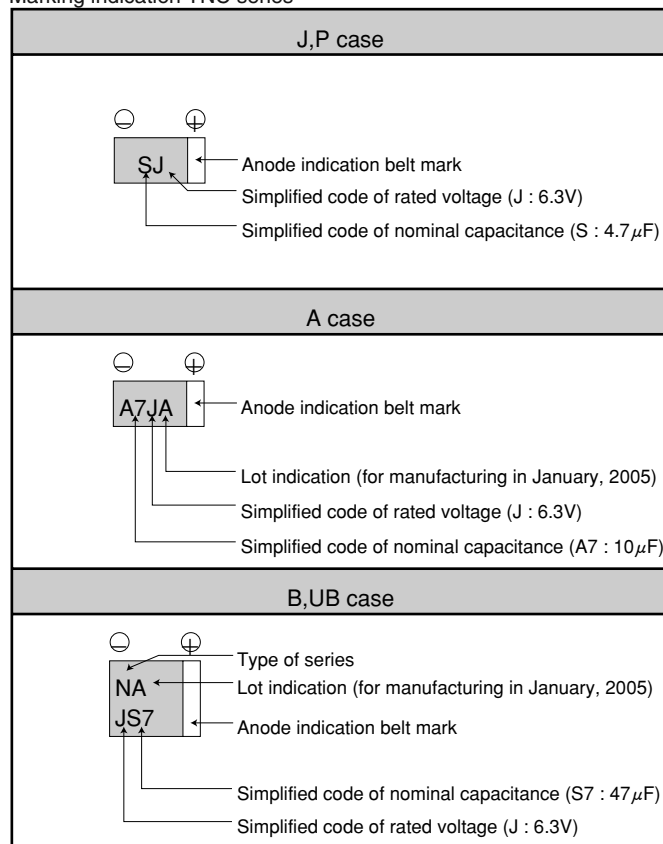
Standard product tables - TNC series

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Rated voltage V.DC	Capacitance μF	tan δ	Leakage current μA	Case code	Product name	ESR (100kHz) mΩ	Maximum permissible ripple current (20C 100kHz) mA _{rms}		
4	10	0.10	10.0	J	TNCJ0G106MTRF	500	320		
		0.10	4.0	P	TNCP0G106MTRF	500	360		
		0.10	4.0	P	TNCP0G106MTRXF	200	560		
		0.10	4.0	A	TNCA0G106MTRF	500	400		
		0.10	4.0	A	TNCA0G106MTRXF	200	620		
		0.10	10.0	P	TNCP0G156MTRF	500	360		
	15	10	0.10	10.0	P	TNCP0G156MTRXF	200	560	
			0.10	6.0	A	TNCA0G156MTRF	500	400	
			0.10	6.0	A	TNCA0G156MTRXF	200	620	
		22	0.10	8.8	A	TNCA0G226MTRF	500	400	
			0.10	8.8	A	TNCA0G226MTRXF	200	620	
			0.10	8.8	B	TNCB0G226MTRF	200	700	
	33	10	0.10	13.2	A	TNCA0G336MTRF	500	400	
			0.10	13.2	A	TNCA0G336MTRXF	200	620	
			0.10	13.2	B	TNCB0G336MTRF	200	700	
		47	0.10	18.8	A	TNCA0G476MTRF	500	400	
			0.10	18.8	A	TNCA0G476MTRXF	200	620	
			0.10	18.8	UB	TNCUB0G476MTRF	200	590	
	68	10	0.10	18.8	UB	TNCUB0G476MTRXF	70	1000	
			0.10	18.8	B	TNCB0G476MTRF	150	800	
			0.10	18.8	B	TNCB0G476MTRXF	70	1170	
			0.10	27.2	UB	TNCUB0G686MTRF	200	590	
			0.10	27.2	UB	TNCUB0G686MTRXF	70	1000	
			0.10	27.2	B	TNCB0G686MTRF	150	800	
		100	0.10	27.2	B	TNCB0G686MTRXF	70	1170	
			0.10	40.0	UB	TNCUB0G107MTRF	70	1000	
			0.10	40.0	B	TNCB0G107MTRF	70	1170	
			0.10	40.0	B	TNCB0G107MTRXF	45	1460	
			150	0.10	40.0	B	TNCB0G157MTRF	70	1170
				0.10	10.0	J	TNCJ0J335MTRF	500	320
	3.3	0.10		3.0	P	TNCP0J475MTRF	500	360	
		0.10		10.0	J	TNCJ0J475MTRF	500	320	
	4.7	0.10		3.0	P	TNCP0J475MTRXF	500	360	
		0.10		3.0	A	TNCA0J475MTRF	500	400	
	6.8	0.10	10.0	J	TNCJ0J685MTRF	500	320		
		0.10	4.2	P	TNCP0J685MTRF	500	360		
0.10		4.2	A	TNCA0J685MTRF	500	400			
10		0.10	10.0	P	TNCP0J106MTRF	500	360		
		0.10	10.0	P	TNCP0J106MTRXF	200	560		
0.10		6.3	A	TNCA0J106MTRF	500	400			
15	0.10	6.3	A	TNCA0J106MTRXF	200	620			
	22	0.10	9.4	A	TNCA0J156MTRF	500	400		
		0.10	9.4	A	TNCA0J156MTRXF	200	620		
	33	0.10	13.8	A	TNCA0J226MTRF	500	400		
		0.10	13.8	A	TNCA0J226MTRXF	200	620		
		47	0.10	20.7	A	TNCA0J336MTRF	500	400	
0.10			20.7	A	TNCA0J336MTRXF	200	620		
0.10			20.7	UB	TNCUB0J336MTRF	200	590		
68		0.10	20.7	UB	TNCUB0J336MTRXF	70	1000		
	0.10	20.7	B	TNCB0J336MTRF	200	700			
	0.10	20.7	B	TNCB0J336MTRXF	70	1170			
	100	0.10	29.6	UB	TNCUB0J476MTRF	200	590		
		0.10	29.6	UB	TNCUB0J476MTRXF	70	1000		
	150	0.10	29.6	B	TNCB0J476MTRF	150	800		
0.10		29.6	B	TNCB0J476MTRXF	70	1170			
22		0.10	42.8	B	TNCB0J686MTRF	150	800		
		0.10	42.8	B	TNCB0J686MTRXF	70	1170		
10		3.3	0.10	63.0	B	TNCB0J107MTRF	100	980	
			0.10	63.0	B	TNCB0J107MTRXF	70	1170	
	0.10		63.0	B	TNCB0J107MTRZF	45	1460		
	4.7	0.10	10.0	J	TNCJ1A335MTRF	500	320		
		0.10	3.3	P	TNCP1A335MTRF	500	360		
		0.10	10.0	J	TNCJ1A475MTRF	500	320		
10	4.7	0.10	4.7	P	TNCP1A475MTRF	500	360		
		0.10	4.7	P	TNCP1A475MTRXF	200	560		
		0.10	4.7	A	TNCA1A475MTRF	500	400		
	15	0.10	4.7	A	TNCA1A475MTRXF	200	620		
		0.10	10.0	A	TNCA1A106MTRF	500	400		
		0.10	10.0	A	TNCA1A106MTRXF	200	620		
22	15	0.10	15.0	A	TNCA1A156MTRF	500	400		
		0.10	15.0	A	TNCA1A156MTRXF	200	620		
	22	0.10	22.0	UB	TNCUB1A226MTRF	200	590		
		0.10	22.0	UB	TNCUB1A226MTRXF	70	1000		

Rated voltage V.DC	Capacitance μF	tan δ	Leakage current μA	Case code	Product name	ESR (100kHz) mΩ	Maximum permissible ripple current (20C 100kHz) mA _{rms}
10	22	0.10	22.0	B	TNCB1A226MTRF	200	700
		0.10	22.0	UB	TNCB1A226MTRXF	70	1170
	33	0.10	33.0	UB	TNCUB1A336MTRF	200	590
		0.10	33.0	UB	TNCUB1A336MTRXF	70	1000
		0.10	33.0	B	TNCB1A336MTRF	200	700
		0.10	33.0	B	TNCB1A336MTRXF	70	1170
	47	0.10	47.0	B	TNCB1A476MTRF	150	800
		0.10	47.0	B	TNCB1A476MTRXF	70	1170

Marking indication TNC series



Lot indication

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
2005	A	B	C	D	E	F	G	H	J	K	L	M
2006	N	P	Q	R	S	T	U	V	W	X	Y	Z
2007	a	b	c	d	e	f	g	h	j	k	l	m
2008	n	p	q	r	s	t	u	v	w	x	y	z