

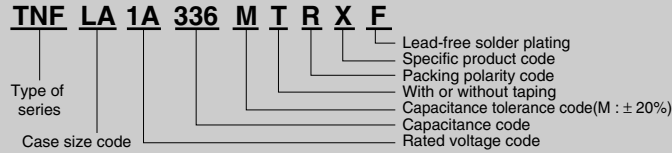
## TNF Series

(High Performance Polymer type Chip Tantalum Capacitor with Face-down Type TNF series)

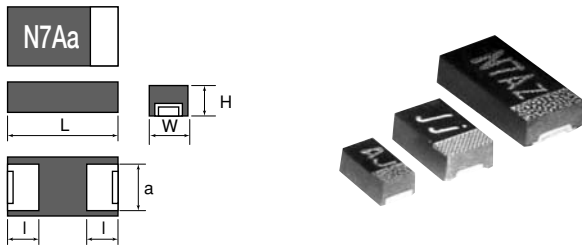
### Features

- A high function and reliability are achieved by uniting the electroconductive polymer and the lower electrode structure.
- This type reduces ESR be using high performance polymer based on our original manufacturing process.
- This type is suitable for high-density implementation such as the multimedia connection.

Product code: (Example) TNF type LA case 10V 33  $\mu$ F  $\pm$ 20%, ESR 200m $\Omega$



### Outline of drawings and dimensions



### Dimensions

(Unit : mm)

Case code	Case size				
	L $\pm$ 0.1	W $\pm$ 0.1	H $\pm$ 0.1	$\phi$ $\pm$ 0.1	a $\pm$ 0.1
LM	1.6	0.85	0.8	0.5	0.65
LP	2.0	1.25	0.9	0.5	0.90
LA	3.2	1.60	0.9	0.8	1.20

### Standard value and case size

Capacitance	Code	Rated voltage (V.DC)			
		2.5	4	6.3	10
10	106			LM	LP
15	156				
22	226			LP	
33	336		LP		LA
47	476	LP		LA	
68	686		LA		
100	107	LA			

Product specifications	TNF	Test conditions JIS C5101-1:1998
Operating temperature range	-55°C ~ +105°C	
Rated voltage	DC2.5 ~ 10V	85°C
Surge voltage	DC3V ~ 13V	85°C
Derated voltage	DC1.6 ~ 6.3V	(105°C)
Capacitance	10 ~ 100 $\mu$ F	120Hz
Capacitance tolerance	$\pm$ 20%	120Hz
Leakage current	Refer to standard product table	—
tan $\delta$	0.1 or less	120Hz
ESR	LM case 500m $\Omega$ <sup>MAX</sup> LP case 200m $\Omega$ , 500m $\Omega$ <sup>MAX</sup> LA case 200m $\Omega$ , 500m $\Omega$ <sup>MAX</sup>	100kHz
Surge withstanding voltage	$\Delta$ C/C $\pm$ 20% or less tan $\delta$ Specified initial value or less LC 300% or less Specified initial value or less	Charge a surge voltage through a protective resistor of 33 $\Omega$ 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	-55 105
	$\Delta$ C/C	- -20~0% 0~+30%
	tan $\delta$	0.10 0.14 -
	LC	Refer to standard product table - 1CV or 30 $\mu$ A or less
Measure the specified characteristics in each stage.		
Solder heat resistance	$\Delta$ C/C $\pm$ 20% or less tan $\delta$ Specified initial value or less LC 300% or less Specified initial value or less	Reflow Board surface peak temperature: 250°C 5S 217°C or more: within 90 sec.
Moisture resistance no load	$\Delta$ C/C +30% ~ -20% or less tan $\delta$ 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	$\Delta$ C/C $\pm$ 20% or less tan $\delta$ 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 3 $\Omega$ for 1000 hours.
Thermal shock	$\Delta$ C/C $\pm$ 20% or less tan $\delta$ 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 $\Omega$ /V).

## Standard product tables - TNF series

Standard product table - TNF series

Rated voltage V . DC	Capacitance $\mu$ F	$\tan \delta$	Leakage current $\mu$ A	Case code	Product name	ESR (100kHz) m $\Omega$	Maximum permissible ripple current (20°C 100kHz) mA <sub>rms</sub>
2.5	47	0.10	11.8	LP	TNFLP0E476MTRF	500	350
		0.10	11.8	LP	TNFLP0E476MTRXF	200	550
	100	0.10	25.0	LA	TNFLA0E107MTRF	500	380
		0.10	25.0	LA	TNFLA0E107MTRXF	200	600
4	33	0.10	13.2	LP	TNFLP0G336MTRF	500	350
		0.10	13.2	LP	TNFLP0G336MTRXF	200	550
	68	0.10	27.2	LA	TNFLA0G686MTRF	500	380
		0.10	27.2	LA	TNFLA0G686MTRXF	200	600
6.3	10	0.10	10.0	LM	TNFLM0J106MTRF	500	320
		0.10	13.9	LP	TNFLP0J226MTRF	500	350
	47	0.10	13.9	LP	TNFLP0J226MTRXF	200	550
		0.10	29.6	LA	TNFLA0J476MTRF	500	380
		0.10	29.6	LA	TNFLA0J476MTRXF	200	600
10	10	0.10	10.0	LP	TNFLP1A106MTRF	500	350
		0.10	10.0	LP	TNFLP1A106MTRXF	200	550
	33	0.10	33.0	LA	TNFLA1A336MTRF	500	380
		0.10	33.0	LA	TNFLA1A336MTRXF	200	600

Marking indication TNF series

LM · LP case		<ul style="list-style-type: none"> <li>① Simplified code of nominal capacitance (J:22<math>\mu</math>F)</li> <li>② Simplified code of rated voltage (j:6.3V)</li> <li>③ Anode indication belt mark</li> </ul>
LA case		<ul style="list-style-type: none"> <li>① Simplified code of nominal capacitance (N7:33<math>\mu</math>F)</li> <li>② Simplified code of rated voltage (A:10V)</li> <li>③ Lot indication (A: for manufacturing in January, 2009)</li> <li>④ Anode indication belt mark</li> </ul>