

NIOBIUM ELECTROLYTIC CAPACITORS

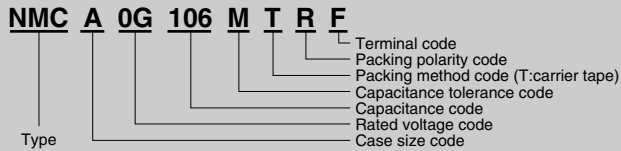
NMC Series (Miniaturized Niobium Capacitors)

Features

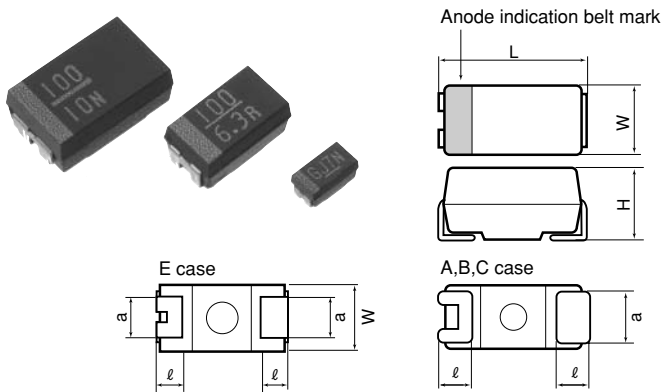
A niobium capacitor is a polar capacitor which makes a dielectric the pent-oxidization niobium formed in the sintering body surface side of niobium metal powder.

It has small and large capacitance and flame retardant feature. Moreover, it is environmental-friendly component which meet lead-free soldering.

Product symbol : (Example) NMC Series A case 4V 10 μ F \pm 20%



Outline of drawings and dimensions



Dimensions (Unit : mm)

Case code	Case size				
	L \pm 0.2	W \pm 0.2	H \pm 0.2	ℓ \pm 0.3	a \pm 0.2
A	3.2	1.6	1.6	0.7	1.2
B	3.5	2.8	1.9	0.8	2.2
C	5.8	3.2	2.5	1.3	2.2
E	7.3	4.3 \pm 0.3	2.8	1.3	2.4

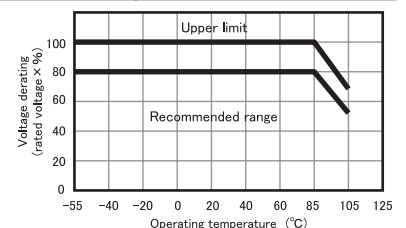
Standard value and case size

Capacitance		Rated voltage (V.DC)			
μ F	Code	2.5	4	6.3	10
10	106			A	A
15	156		A	A	B
22	226	A	A	A,B	B
33	336	B	A,B	A,B	B,C
47	476	B	A,B	B	C
68	686	B,C	B,C	B,C	C
100	107	B,C	B,C	B,C,E	E
150	157	C,E	C,E	E	E
220	227	C,E	E	E	E
330	337	E	E	E	
470	477	E	E		

Product specifications	NMC	Test conditions JIS C5101-1:1998																																							
Operating temperature range	-55°C ~ +105°C																																								
Rated voltage	DC2.5 ~ 10V	85°C																																							
Surge voltage	DC3.3 ~ 13V	85°C																																							
Derated voltage	DC1.7 ~ 7V	105°C																																							
Capacitance	10 ~ 470 μ F	120 Hz, 1.5V																																							
Capacitance tolerance	\pm 20%	Paragraph 4.7, 120 Hz, 1.5V																																							
Leakage current	Refer to Standard product table	Paragraph 4.9, in 5 minutes after the rated voltage is applied.																																							
tan δ	Refer to Standard product table	Paragraph 4.8, 120Hz, 1.5V																																							
Surge withstanding voltage	Δ C/C \pm 10% or less tan δ Specified initial value or less LC Specified initial value or less	Paragraph 4.26																																							
Temperature characteristics	<table border="1"> <thead> <tr> <th>Specified initial value</th> <th>-55</th> <th>85</th> <th>105</th> </tr> </thead> <tbody> <tr> <td>ΔC/C</td> <td>-</td> <td>-20 - 0%</td> <td>0 - +20%</td> <td>0 - +25%</td> </tr> <tr> <td>tanδ</td> <td>0.08</td> <td>0.11</td> <td>0.10</td> <td>0.11</td> </tr> <tr> <td>Max.storable or less</td> <td>0.10</td> <td>0.13</td> <td>0.12</td> <td>0.13</td> </tr> <tr> <td></td> <td>0.12</td> <td>0.16</td> <td>0.14</td> <td>0.16</td> </tr> <tr> <td></td> <td>0.15</td> <td>0.21</td> <td>0.19</td> <td>0.21</td> </tr> <tr> <td></td> <td>0.30</td> <td>0.39</td> <td>0.36</td> <td>0.39</td> </tr> <tr> <td>LC</td> <td>0.02CV or less</td> <td>0.02CV or less</td> <td>0.2CV or less</td> <td>0.25CV or less</td> </tr> </tbody> </table>	Specified initial value	-55	85	105	Δ C/C	-	-20 - 0%	0 - +20%	0 - +25%	tan δ	0.08	0.11	0.10	0.11	Max.storable or less	0.10	0.13	0.12	0.13		0.12	0.16	0.14	0.16		0.15	0.21	0.19	0.21		0.30	0.39	0.36	0.39	LC	0.02CV or less	0.02CV or less	0.2CV or less	0.25CV or less	Paragraph 4.24
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Solder heat resistance	Δ C/C \pm 30% or less tan δ Specified initial value or less LC Specified initial value or less	Reflow 260 \pm 5°C or less 10 \pm 1 sec.																																							
Moisture resistance no load	Δ C/C \pm 30% or less tan δ Specified initial value or less LC Specified initial value or less	Paragraph 4.22, 40°C 90 ~ 95%RH, 500hrs																																							
High-temperature load	Δ C/C \pm 30% or less tan δ Specified initial value or less LC 200% Specified initial value or less	Paragraph 4.23 85°C The Rated voltage is applied for 2000 hours.																																							
Thermal shock	Δ C/C \pm 20% or less tan δ Specified initial value or less LC Specified initial value or less	Leave at -55°C, normal temperature, 105°C, and normal temperature for 30 min., 3 min., 30 min., and 3 min. Repeat this operation 5 times running.																																							
Moisture resistance load	Δ C/C \pm 30% or less tan δ Specified initial value or less LC 200% Specified initial value or less	40°C, humidity 90 to 95%RH The rated voltage is applied for 500 hours.																																							
Failure rate	1% / 1000hrs	85°C. The rated voltage is applied (through a protective resistor of 1 Ω /V).																																							

Operating Voltage

※ The voltage derating factor should be as great as possible. Under normal conditions, the operating voltage should be reduced to 80% or less of the rated.



※ This catalog is designed for providing general information.

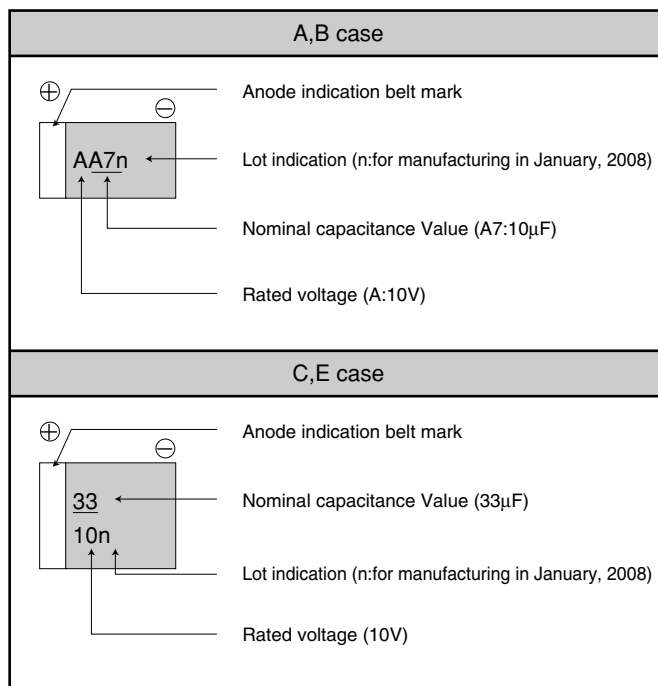
Please inquire of our Sales Department to confirm specifications prior to us.

Standard product tables - NMC series

Standard product table - NMC series

Rated voltage V. DC	Capacitance μF	tanδ	Leakage current μA	Case code	Product name	
2.5	22	0.08	1.1	A	NMCA0E226	
	33	0.10	1.6	B	NMCB0E336	
	47	0.10	2.3	B	NMCB0E476	
	68	0.12	3.4	B	NMCB0E686	
		0.10	3.4	C	NMCC0E686	
	100	0.30	5.0	B	NMCB0E107	
		0.10	5.0	C	NMCC0E107	
	150	0.12	7.5	C	NMCC0E157	
		0.12	7.5	E	NMCE0E157	
	220	0.12	11.0	C	NMCC0E227	
		0.12	11.0	E	NMCE0E227	
	330	0.12	16.5	E	NMCE0E337	
	470	0.30	23.5	E	NMCE0E477	
4	15	0.08	1.2	A	NMCA0G156	
	22	0.08	1.7	A	NMCA0G226	
	33	0.30	2.6	A	NMCA0G336	
		0.10	2.6	B	NMCB0G336	
	47	0.30	3.7	A	NMCA0G476	
		0.10	3.7	B	NMCB0G476	
	68	0.12	5.4	B	NMCB0G686	
		0.10	5.4	C	NMCC0G686	
	100	0.30	8.0	B	NMCB0G107	
		0.10	8.0	C	NMCC0G107	
	150	0.30	12.0	C	NMCC0G157	
		0.12	12.0	E	NMCE0G157	
	220	0.12	17.6	E	NMCE0G227	
	330	0.12	26.4	E	NMCE0G337	
	470	0.30	37.6	E	NMCE0G477	
	6.3	10	0.08	1.2	A	NMCA0J106
		15	0.08	1.8	A	NMCA0J156
22		0.10	2.7	A	NMCA0J226	
		0.10	2.7	B	NMCB0J226	
33		0.30	4.1	A	NMCA0J336	
		0.10	4.1	B	NMCB0J336	
47		0.10	5.9	B	NMCB0J476	
		0.12	8.5	B	NMCB0J686	
68		0.10	8.5	C	NMCC0J686	
		0.30	12.6	B	NMCB0J107	
100		0.15	12.6	C	NMCC0J107	
		0.12	12.6	E	NMCE0J107	
		0.12	18.9	E	NMCE0J157	
220		0.12	27.7	E	NMCE0J227	
330		0.30	41.5	E	NMCE0J337	
10		10	0.08	2.0	A	NMCA1A106
		15	0.10	3.0	B	NMCB1A156
	22	0.10	4.4	B	NMCB1A226	
		0.15	6.6	B	NMCB1A336	
	33	0.10	6.6	C	NMCC1A336	
		0.10	9.4	C	NMCC1A476	
	68	0.30	13.6	C	NMCC1A686	
	100	0.12	20.0	E	NMCE1A107	
	150	0.12	30.0	E	NMCE1A157	
	220	0.30	44.0	E	NMCE1A227	

Marking indication



Lot indication

Month Year	1	2	3	4	5	6	7	8	9	10	11	12
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
2009	A	B	C	D	E	F	G	H	J	K	L	M
2010	N	P	Q	R	S	T	U	V	W	X	Y	Z