

Date of application

**Aug.27.2004**

**NICHICON CORPORATION**

**NICHICON TANTALUM CORPORATION**

ENGINEERING DEPT.

# SPECIFICATION

## TANTALUM ELECTROLYTIC CAPACITORS

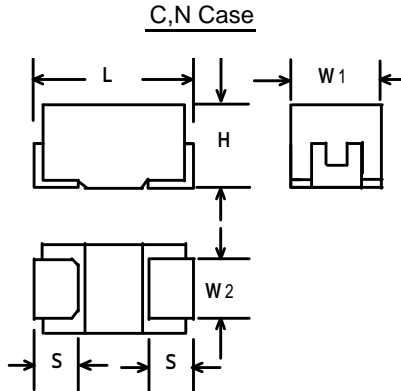
F91

DWG,No.	<b>TA20589</b>	CHECKED	<i>T. Minobe</i>
DESIGNED	<i>R. Miyamoto</i>	APPROVED	<i>T. Katayama</i>

TYPE F91 SOLID TANTALUM ELECTROLYTIC CAPACITORS

TAPE REEL PACKAGING

1. PART DIMENSIONS



(FIG.-1)

CASE CODE	(mm)				
	L	W <sub>1</sub>	W <sub>2</sub>	H	S
C	6.0±0.2	3.2±0.2	2.4±0.1	2.5±0.2	1.3±0.2
N	7.3±0.2	4.3±0.2	2.4±0.1	2.8±0.2	1.3±0.2

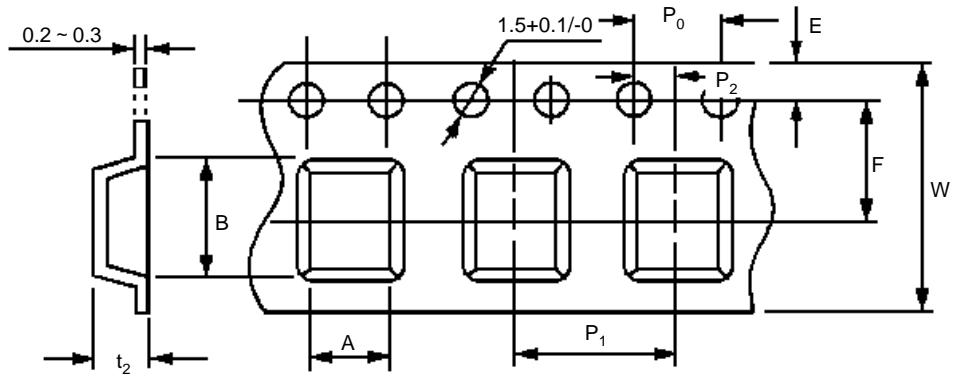
	名称 TITLE		日付 DATA		
	F91		2004.8.27		
<b>ニチコン tantalum 株式会社</b> <b>NICHICON TANTALUM CORPORATION</b>	承認 APPROVAL	照査 CHECK	担当 DESIGN	図番 DRAWING No.	頁 PAGE
	<i>K. Kato</i>	<i>T. Minobe</i>	<i>T. Miyamoto</i>	TA20589	1/9

4. LOCATION CHART

uF \ V	2.5	4	6.3	10	16	20	25	35
6.8								C
10						C	C	N
15						C	N	N
22							N	N
33					C	N	N	
47				C	N			
68				C				
100		C	C	C N				
150		C	C N	N				
220	C	C N	C N	N				
330		N	N	N				
470	N	N	N					
680		N						

3. TAPE REEL PACKAGING SPECIFICATIONS

3-1 TAPE SIZE AND POLARITY IN THE TAPES



CASE CODE	W	F	E	P <sub>1</sub>	P <sub>2</sub>	P <sub>0</sub>
C, N	12.0±0.3	5.5±0.05	1.75 +0.1	8.0±0.1	2.0±0.05	4.0±0.1

CASE CODE	A	B	t <sub>2</sub>	TOTAL NUMBER OF COMPONENTS	
				REEL Dia 180	REEL Dia 330
C	3.6±0.1	6.0±0.1	2.9MAX	500pcs.	2500pcs.
				750pcs.	
N	4.8±0.1	7.7±0.1	3.5MAX	500pcs.	2500pcs.
				750pcs.	

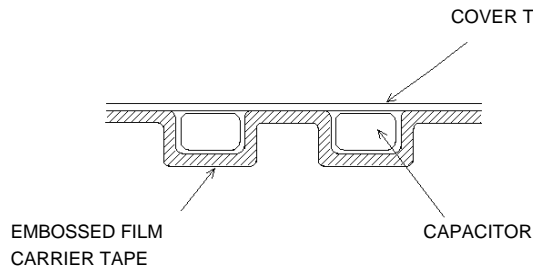
CASE CODE	TAPING CODE		TAPE WIDTH	POLARITY
	REEL Dia 180	REEL Dia 330		
C, N	500pcs.	C	12mm	R [ Anode is at opposite side of feeding holes ]
	750pcs.	M*		
		G	12mm	R [ Anode is at opposite side of feeding holes ]

\* Quasi-Standard

(TABLE-1)

3-2-1 CAPACITORS ON TAPE

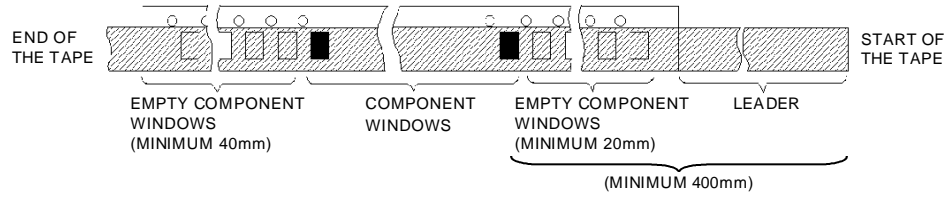
Capacitors are inserted as shown in Fig.-4, the cover-tape shall not cover the 1/2 of sprocket holes.



(FIG.-4)

3-2-2 TAPE-LEADING PORTION

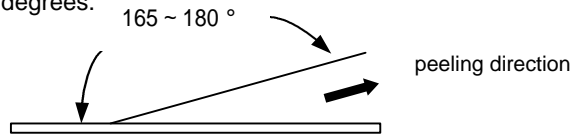
A certain length of tape are left open at the beginning and the end as a tape leader portion.



(FIG.-5)

3-2-3 PEEL BACK STRENGTH

The top cover tape shall have a peel back force of 10 to 70 grams measured at an angle of 165 to 180 degrees.



3-2-4 PARTS MISSING

Parts missing from the tape between the first part and the last of any reel shall not exceed 0.1 percent or 1pc. whichever the larger and not observed consecutively.

3-3 PACKAGING

REEL SIZE AND PACKAGING QUANTITY

REEL DIAMETER 180					REEL DIAMETER 180				
WIDTH OF TAPE : 12mm									
A	B	E	W <sub>1</sub>	W <sub>2</sub>	A	B	E	W <sub>1</sub>	W <sub>2</sub>
+0/-3	MIN.	±0.5	±0.3	±1.0	±2.0	±1.0	±0.5	±0.5	±1.0
180	50	2.0	13.0	15.4	330	80	2.0	13.5	17.5

(TABLE-2)

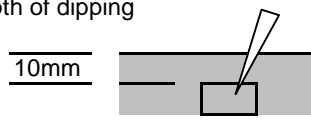
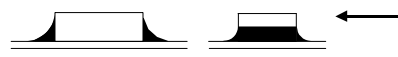
3-4 MARKING

Each reel or package is marked as follows.

- (1) NICHICON TANTALUM TYPE NUMBER.
- (2) RATED VOLTAGE.
- (3) RATED CAPACITANCE AND TOLERANCE ON RATED CAPACITANCE.
- (4) MANUFACTURED DATE CODE.
- (5) QUANTITY.

4. PERFORMANCE CHARACTERISTICS

(TABLE-3)

No.	Item	Performance characteristics	Test method	
			JIS C 5101-3	Point
1	Category temp. range	-55 ~ +125		
2	Rated temp.	+85		
3	Leakage current	Not exceed the value shown in TABLE-4	4.5.1	Applied V. : Rat. V. Applied time : 1 min Series protective resistor : 1k
4	Rated capacitance	To be within the range of specified tolerance	4.5.2	Meas. Freq. : 120Hz±10% Meas. V. : 0.5Vrms MAX. +1.5 ~ 2V.D.C. Meas. Temp. : 20
5	Dissipation factor	Not exceed the value shown in TABLE-4		
6	E.S.R	Not exceed the value shown in TABLE-4	4.5.3	Meas. Freq. : 100kHz±10% Meas. Temp. : 20
7	Resistance to soldering heat			Reflow soldering Temp. : 260±5 Time : 10s
	Appearance	No marked change		
	Leakage current	Not exceed the value shown in No.3		
	Capacitance change	Within±5% of the value before test		
	Dissipation factor	Not exceed the value shown in No.5		
8	Solderability	The dipped termination is at least 75 percent covered by a continuous new solder coating	4.7	Solder temp. : 245±3 Immersion duration : 2 ~ 3s Depth of dipping 
9	Mount on substrate			Reflow soldering Temp. : 260±5 Time : 10s
	Appearance	No marked change		
	Leakage current	Not exceed the value shown in No.3		
	Capacitance change	Within±5% of the value before test		
	Dissipation factor	Not exceed the value shown in No.5		
10	Shear test	No mechanical failure or evidence considered a failure	The terminals shall withstand a constant of 5N applied parallel to the seating surface for 10±1 seconds on Alumina substrate.  5N(0.51kg · f), 10±1s	

(TABLE-3)

No.	Item	Performance characteristics	Test method																						
			JIS C 5101-3	Point																					
11	Rapid change of temperature		4.10	<table border="1" style="margin: auto;"> <thead> <tr> <th>Step</th> <th>Temp. ( )</th> <th>Time ( s )</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55+0/-3</td> <td>30±3</td> </tr> <tr> <td>2</td> <td>R.T.</td> <td>3 max</td> </tr> <tr> <td>3</td> <td>125+3/-0</td> <td>30±3</td> </tr> <tr> <td>4</td> <td>R.T.</td> <td>3 max</td> </tr> </tbody> </table> <p>Number of cycles : 5cycles</p>	Step	Temp. ( )	Time ( s )	1	-55+0/-3	30±3	2	R.T.	3 max	3	125+3/-0	30±3	4	R.T.	3 max						
	Step	Temp. ( )			Time ( s )																				
	1	-55+0/-3			30±3																				
	2	R.T.			3 max																				
	3	125+3/-0			30±3																				
4	R.T.	3 max																							
Appearance	No marked change																								
Leakage current	Not exceed the value shown in No.3																								
Capacitance change	Within ±5% of the value before test																								
Dissipation factor	Not exceed the value shown in No.5																								
12	Damp heat, steady state		4.12	Test temp. : 40±2 Test hum. : 90 ~ 95%R.H Test time : 500 +24/-0h																					
	Appearance	No marked change																							
	Leakage current	Not exceed the value shown in No.3																							
	Capacitance change	Within ±10% of the value before test																							
	Dissipation factor	Not exceed the value shown in No.5																							
13	Endurance		4.15	Test temp. : 85±2 Test time : 2000 +72/-0h Applied V. : Rat.V Source impedance : 3 max.  Test temp. : 125±3 Test time : 2000 +72/-0h Applied V. : Derat.V Source impedance : 3 max.																					
	Appearance	No marked change																							
	Leakage current	Not exceed the value shown in No.3																							
	Capacitance change	Within ±10% of the value before test																							
	Dissipation factor	Not exceed the value shown in No.5																							
14	Characteristics at high and low temperature		4.13	<table border="1" style="margin: auto;"> <thead> <tr> <th>Step</th> <th>Temp.( )</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>20±2</td> <td>—</td> </tr> <tr> <td>2</td> <td>-55+0/-3</td> <td>—</td> </tr> <tr> <td>3</td> <td>20±2</td> <td>15 min</td> </tr> <tr> <td>4</td> <td>85+3/-0</td> <td>2h</td> </tr> <tr> <td>5</td> <td>125+3/-0</td> <td>2h</td> </tr> <tr> <td>6</td> <td>20±2</td> <td>—</td> </tr> </tbody> </table>	Step	Temp.( )	Time	1	20±2	—	2	-55+0/-3	—	3	20±2	15 min	4	85+3/-0	2h	5	125+3/-0	2h	6	20±2	—
	Step	Temp.( )			Time																				
	1	20±2			—																				
	2	-55+0/-3			—																				
	3	20±2			15 min																				
	4	85+3/-0			2h																				
	5	125+3/-0			2h																				
	6	20±2			—																				
	Step2 -55	Capacitance change			Within +0/-10% of the value in step1																				
		Dissipation factor			Not exceed +2% of the value shown in No.5																				
	Step4 85	Leakage current			Not exceed 10 times of the value shown in No.3																				
		Capacitance change			Within +10/-0% of the value in step1																				
	Step5 125	Dissipation factor			Not exceed the value shown in No.5																				
		Leakage current			Not exceed 12.5 times of the value shown in No.3																				
Step6	Capacitance change	Within +15/-0% of the value in step1																							
	Dissipation factor	Not exceed +2% of the value shown in No.5																							
Step6	Leakage current	Not exceed the value shown in No.3																							
	Capacitance change	Within ±3% of the value in step1																							
	Dissipation factor	Not exceed the value shown in No.5																							

(TABLE-3)

No.	Item	Performance characteristics	Test method	
			JIS C 5101-3	Point
15	Surge		4.14	Test temp. : 85±2 Applied V. : Surge voltage Series protective resistor : 33ohm Discharge resistor : 33ohm Charge discharge time : 30±5s Number of cycles : 1000cycles
	Appearance	No marked change		
	Leakage current	Not exceed the value shown in No.3		
	Capacitance change	Within ±5% of the value before test		
	Dissipation factor	Not exceed the value shown in No.5		
16	Terminal strength		With the chip soldered to the test fixture as illustrated, a force sufficient to cause an 1mm deflection shall be applied. 	
	Appearance	No marked change		
	Capacitance	No electrical failue		

5. MARKING

Capacitors shall be marked with the rated capacitance and rated d-c working voltage.

5-1 POLARITY

The anode terminal on each capacitor is identified by a plus sign( + )

C Case	
N Case	



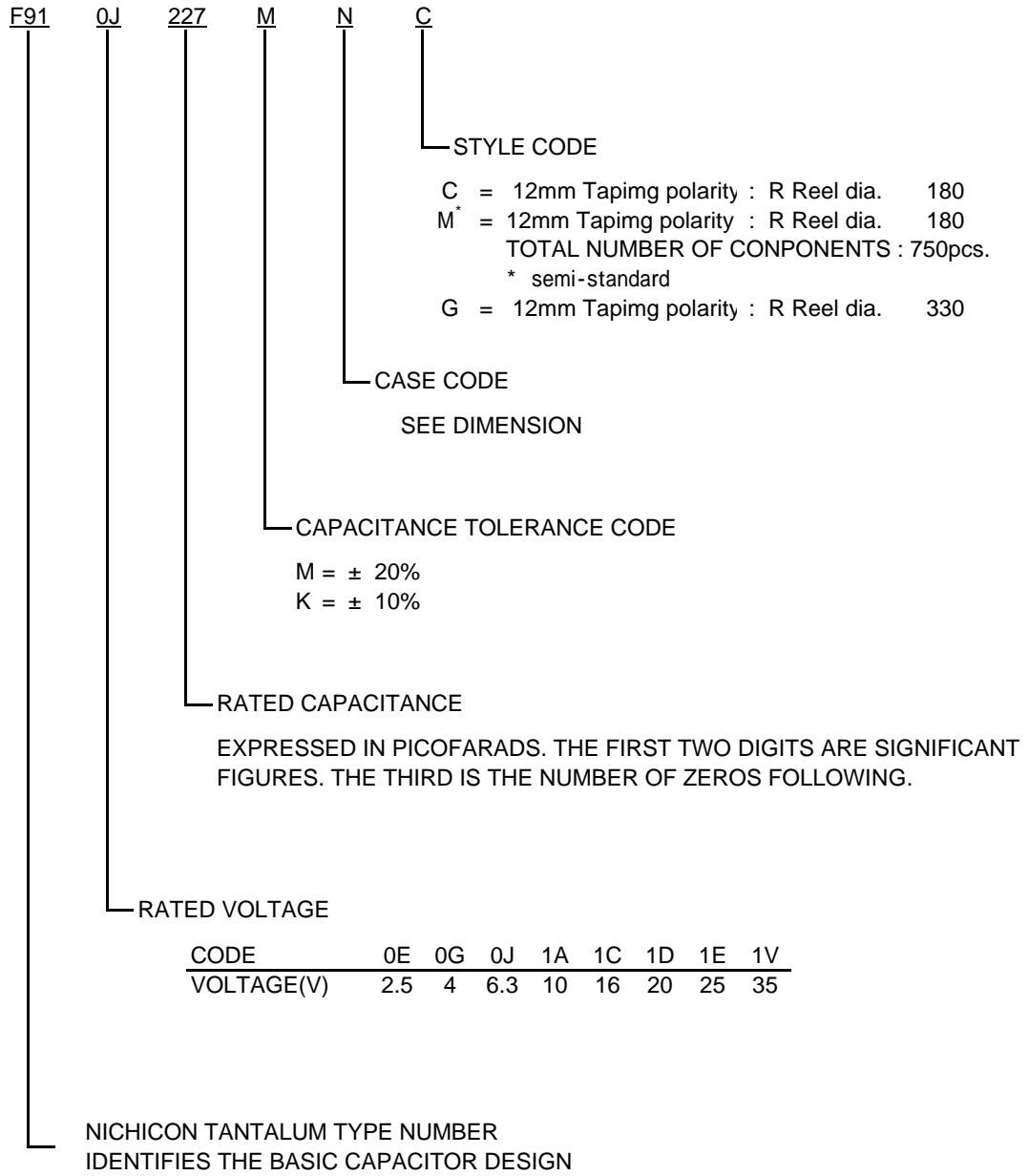
6. RATINGS

(TABLE-4)

CATALOG NUMBER	D.C Work Volt. 85 (V)	D.C Derat Volt. 125 (V)	Surge Volt 85 (V)	Rated Cap. (uF)	Cap. Tol. (%)	MAX. DCL 20 (uA)	MAX D.F. 20 (%)	MAX ESR 20 (m )	Case Code	Marking	
										Volt.	Cap.
F910E227-C-	2.5	1.6	3.2	220	±20,±10	5.5	12	250	C	2.5V	220
F910E477-N-	2.5	1.6	3.2	470	±20,±10	11.8	12	100	N	2.5V	470
F910G107-C-	4	2.5	5.2	100	±20,±10	4.0	10	300	C	4V	100
F910G157-C-	4	2.5	5.2	150	±20,±10	6.0	12	250	C	4V	150
F910G227-C-	4	2.5	5.2	220	±20,±10	8.8	12	250	C	4V	220
F910G227-N-	4	2.5	5.2	220	±20,±10	8.8	10	100	N	4V	220
F910G337-N-	4	2.5	5.2	330	±20,±10	13.2	10	100	N	4V	330
F910G477-N-	4	2.5	5.2	470	±20,±10	18.8	16	100	N	4V	470
F910G687-N-	4	2.5	5.2	680	±20,±10	27.2	18	100	N	4V	680
F910J107-C-	6.3	4	8	100	±20,±10	6.3	10	250	C	6V	100
F910J157-C-	6.3	4	8	150	±20,±10	9.5	12	250	C	6V	150
F910J157-N-	6.3	4	8	150	±20,±10	9.5	10	100	N	6V	150
F910J227-C-	6.3	4	8	220	±20,±10	13.9	14	250	C	6V	220
F910J227-N-	6.3	4	8	220	±20,±10	13.9	10	100	N	6V	220
F910J337-N-	6.3	4	8	330	±20,±10	20.8	14	100	N	6V	330
F910J477-N-	6.3	4	8	470	±20,±10	29.6	16	100	N	6V	470
F911A476-C-	10	6.3	13	47	±20,±10	4.7	8	400	C	10V	47
F911A686-C-	10	6.3	13	68	±20,±10	6.8	8	300	C	10V	68
F911A107-C-	10	6.3	13	100	±20,±10	10.0	10	250	C	10V	100
F911A107-N-	10	6.3	13	100	±20,±10	10.0	10	100	N	10V	100
F911A157-N-	10	6.3	13	150	±20,±10	15.0	10	100	N	10V	150
F911A227-N-	10	6.3	13	220	±20,±10	22.0	12	100	N	10V	220
F911A337-N-	10	6.3	13	330	±20,±10	33.0	18	100	N	10V	330
F911C336-C-	16	10	20	33	±20,±10	5.3	8	400	C	16V	33
F911C476-N-	16	10	20	47	±20,±10	7.5	6	150	N	16V	47
F911D106-C-	20	13	26	10	±20,±10	2.0	6	450	C	20V	10
F911D156-C-	20	13	26	15	±20,±10	3.0	6	450	C	20V	15
F911D336-N-	20	13	26	33	±20,±10	6.6	6	200	N	20V	33
F911E106-C-	25	16	32	10	±20,±10	2.5	6	450	C	25V	10
F911E156-N-	25	16	32	15	±20,±10	3.8	6	250	N	25V	15
F911E226-N-	25	16	32	22	±20,±10	5.5	6	200	N	25V	22
F911E336-N-	25	16	32	33	±20,±10	8.3	8	200	N	25V	33
F911V685-C-	35	22	46	6.8	±20,±10	2.4	6	600	C	35V	6.8
F911V106-N-	35	22	46	10	±20,±10	3.5	6	300	N	35V	10
F911V156-N-	35	22	46	15	±20,±10	5.3	6	300	N	35V	15
F911V226-N-	35	22	46	22	±20,±10	7.7	8	300	N	35V	22

See section 3 and 7

7. CATALOG NUMBERING SYSTEM



Country of origin

JAPAN

NICHICON TANTALUM CORPORATION

CHINA

NICHICON ELECTREONICS TRADING (TIANJIN) CO., LTD.

A product of China appends BMA at the end of part number.

exa.) F910J157MNC      F910J157MNCBMA

図番 DRAWING No.	頁 PAGE
_____	_____