

TO: _____

Date: 2017-11-16
Customer's
Specification No. _____

APPROVAL SPECIFICATION

Item : TANTALUM CHIP CAPACITORS

Matsuo Catalog number	Ratings
267 E 1602 225 K R	16VDC 2.2 μ F \pm 10%
267 E 1602 106 K R 533	16VDC 10 μ F \pm 10%

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Matsuo's Special Product Code	533
Approval Sheet No.	2671612



267161201

TANTALUM CHIP CAPACITORS TYPE 267 (Extended Capacitance Range)	DRAWING No. 121-0E267-001/50		REVISION 27
	TYPE 267	SHEET 1 OF 9	

1. Scope

This specification specifies characteristics, ratings and dimensions of polarized tantalum solid electrolytic capacitors Type 267 series E (Extended Capacitance Range).

2. Ratings

Ratings shall be specified in Table 1.

Table 1

Item	Description
Category temperature range (Operating temperature)	-55 to +125 °C
Rated temperature (Maximum operating temperature for DC rated voltage)	+85°C ⁽¹⁾
DC rated voltage range[U _R]	} See detail specification
Nominal capacitance range[C _R]	
Nominal capacitance tolerance	
Failure rate level	1%/1000h

Note⁽¹⁾ : For operation 125°C, derate voltage linearly to 67% of 85°C voltage rating.

3. Structure and dimensions

Structure and dimensions shall be specified in detail specification.

4. Performance**4.1 Leakage current(μA) (JIS C 5101-1 paragraph 4.9)**

(1) Performance

Shall not exceed 0.01 CV or 0.5 whichever is greater.

(2) Test condition

Voltage : Rated Voltage for 5 min.

4.2 Capacitance (JIS C 5101-1 paragraph 4.7)

(1) Performance

Shall be within tolerance of the nominal value specified.

(2) Test condition

(a) Frequency : 120 Hz

(b) Temperature : 20°C

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1990-02-14	CHECKED BY M.Yonezawa				
-----	APPROVED BY -----				
DATE	NAME	REVISION	DATE	REVISION RECORD	CHECKED BY
		27	2017-09-15	Revised in form (All pages revised).	N.H

Form E-14G

MATSUO ELECTRIC CO., LTD.



267161202

TANTALUM CHIP CAPACITORS
TYPE 267 (Extended Capacitance Range)

DRAWING No.

121-0E267-001/50

REVISION

27

TYPE 267

SHEET 2 OF 9

4.3 Dissipation factor(JIS C 5101-1 paragraph 4.8)

(1) Performance

See detail specification.

(2) Test condition

Same measuring condition as in paragraph 4.2

4.4 ESR(Equivalent series resistance) (JIS C 5101-1 paragraph 4.8)

(1) Performance

See detail specification.

(2) Test method

(a) Frequency : 10kHz or 100kHz

(b) Temperature : 20°C

4.5 Characteristics at high and low temperature (JIS C 5101-1 paragraph 4.29)

(1) Step1(+20°C)

(a) Leakage current(μA) : Shall not exceed the value in paragraph 4.1

(b) Capacitance : Shall be within tolerance of the nominal value specified

(c) Dissipation factor : Shall not exceed the value in paragraph 4.3

(2) Step2(-55°C)

(a) Capacitance : See detail specification.

(b) Dissipation factor : See detail specification.

(3) Step3(+20°C)

(a) Leakage current(μA) : Shall not exceed the value in paragraph 4.1(b) Capacitance : Within $\pm 2\%$ of initial value

(c) Dissipation factor : Shall not exceed the value in paragraph 4.3

(4) Step4(+85°C)

(a) Leakage current(μA) : See detail specification.

(b) Capacitance : See detail specification.

(c) Dissipation factor : See detail specification.

(5) Step5(+125°C)

(a) Leakage current(μA) : See detail specification.

(b) Capacitance : See detail specification.

(c) Dissipation factor : See detail specification.

(6) Step6(+20°C)

(a) Leakage current(μA) : Shall not exceed the value in paragraph 4.1(b) Capacitance : Within $\pm 2\%$ of initial value.

(c) Dissipation factor : Shall not exceed the value in paragraph 4.3

TANTALUM CHIP CAPACITORS
TYPE 267 (Extended Capacitance Range)

DRAWING No.

121-0E267-001/50

REVISION

27

TYPE 267

SHEET 3 OF 9

4.6 Surge (JIS C 5101-1 paragraph 4.26)

(1) Performance

- (a) Leakage current(μA) : See detail specification.
- (b) Capacitance : See detail specification.
- (c) Dissipation factor : Shall not exceed the value in paragraph 4.3
- (d) Visual examination : There shall be no evidence of mechanical damage

(2) Test condition

- (a) Temperature : 85°C or 125°C
- (b) Applied voltage : DC surge voltage
- (c) Series protective resistance : $1000\ \Omega$
- (d) Discharge resistance : $1000\ \Omega$

4.7 Shear (formerly adhesion) test (JIS C 5101-1 paragraph 4.34)

(1) Performance

No exfoliation between lead terminal and board

(2) Test condition

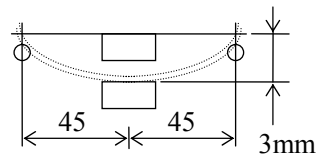
- (a) Mounting Method is as follows
 - Soldering : Indirect heating
 - Temperature : $240 \pm 10^{\circ}\text{C}$
 - Duration : 10s or less
- (b) Applied pressure : 5N
- (c) Duration : $10 \pm 1\text{s}$

4.8 Substrate bending test (JIS C 5101-1 paragraph 4.35)

(1) Performance

Capacitance shall be stable during bending position of the substrate

(2) Test condition



4.9 Vibration (JIS C 5101-1 paragraph 4.17)

(1) Performance

- (a) Capacitance : Initial value to remain steady during measurement
- (b) Visual examination : There shall be no evidence of mechanical damage

(2) Test condition

- (a) Frequency range : 10 to 55Hz
- (b) Duration : 2h in each of three mutually perpendicular directions(total of 6 h)



267161204

TANTALUM CHIP CAPACITORS
TYPE 267 (Extended Capacitance Range)

DRAWING No.

121-0E267-001/50

REVISION

27

TYPE 267

SHEET 4 OF 9

4.10 Shock (specified pulse) (JIS C 5101-1 paragraph 4.17)**(1) Performance**

There shall be no intermittent contact of 0.5 ms or greater duration or arking or other indication of breakdown, nor shall there be any open or short-circuiting or evidence of mechanical damage

(2) Test condition

- (a) Peak value : 490m/s^2
- (b) Duration : 11ms
- (c) Wave form : Half-sine

4.11 Solderability (JIS C 5101-1 paragraph 4.15)**(1) Performance**

The dipped portion of the lead shall be covered more than 3/4 with new solder

(2) Test condition

- (a) Solder temperature : 230°C
- (b) Dipping time : 3 to 5s
- (c) Capacitor terminal shall be dipped into melted solder

4.12 Resistance to soldering heat (JIS C 5101-1 paragraph 4.14)**(1) Performance**

- (a) Leakage current(μA) : See detail specification.
- (b) Capacitance : See detail specification.
- (c) Dissipation factor : Shall not exceed the value in paragraph 4.3
- (d) Visual examination : There shall be no evidence of mechanical damage

(2) Test condition

Capacitors shall be applied one of following condition (a) or (b).

For 20V-100 μF H case and 25V-100 μF H case, shall be applied condition (c) only.

- (a) Completely dipping
 - Solder temperature : $260 \pm 5^\circ\text{C}$
 - Duration : $10 \pm 1\text{s}$
- (b) Terminal dipping
 - Solder temperature : $260 \pm 5^\circ\text{C}$
 - Duration : $10 \pm 1\text{s}$
- (c) IR reflow
 - 260°C max.

4.13 Component solvent resistance (JIS C 5101-1 paragraph 4.31)**(1) Performance**

- (a) Leakage current(μA) : Shall not exceed the value in paragraph 4.1
- (b) Capacitance : See detail specification.
- (c) Dissipation factor : Shall not exceed the value in paragraph 4.3

(2) Test condition

- (a) Temperature : $23 \pm 5^\circ\text{C}$
- (b) Dipping time : 5 ± 0.5 min.
- (c) Conditioning : JIS C 0052 method 2
- (d) Solvent : 2-propanol (Isopropyl alcohol)



267161205

TANTALUM CHIP CAPACITORS
TYPE 267 (Extended Capacitance Range)

DRAWING No.

121-0E267-001/50

REVISION

27

TYPE 267

SHEET 5 OF 9

4.14 Solvent resistance of marking (JIS C 5101-1 paragraph 4.32)

(1) Performance

Visual examination : After the test the marking shall be legible.

(2) Test condition

- (a) Temperature : $23 \pm 5^{\circ}\text{C}$
- (b) Dipping time : 5 ± 0.5 min.
- (c) Conditioning : JIS C 0052 method 1
- (d) Solvent : 2-propanol (Isopropyl alcohol)
- (e) Rubbing material : cotton wool

4.15 Rapid change of temperature (JIS C 5101-1 paragraph 4.16)

(1) Performance

- (a) Leakage current(μA) : See detail specification.
- (b) Capacitance : See detail specification.
- (c) Dissipation factor : Shall not exceed the value in paragraph 4.3
- (d) Visual examination : There shall be no evidence of mechanical damage

(2) Test condition

- Number of cycles : 5
- (a) Step 1 : $-55 \pm 3^{\circ}\text{C}$, 30 \pm 3 min.
 - (b) Step 2 : $25 -5/+10^{\circ}\text{C}$, 3 min. max.
 - (c) Step 3 : $+125 \pm 2^{\circ}\text{C}$, 30 \pm 3 min.
 - (d) Step 4 : $25 -5/+10^{\circ}\text{C}$, 3 min. max.

4.16 Damp heat , steady state (JIS C 5101-1 paragraph 4.22)

(1) Performance

- (a) Leakage current(μA) : See detail specification.
- (b) Capacitance : See detail specification.
- (c) Dissipation factor : Shall not exceed the value in paragraph 4.3
- (d) Visual examination : There shall be no evidence of mechanical damage

(2) Test condition

- (a) Temperature : 40°C
- (b) Moisture : 90 to 95% R.H.
- (c) Duration : 500h

4.17 Endurance (JIS C 5101-1 paragraph 4.23)

(1) Performance

- (a) Leakage current(μA) : See detail specification.
- (b) Capacitance : See detail specification.
- (c) Dissipation factor : Shall not exceed the value in paragraph 4.3
- (d) Visual examination : There shall be no evidence of mechanical damage

(2) Test condition

- (a) Temperature : 85°C or 125°C
- (b) Applied voltage : DC rated voltage at 85°C .
DC rated voltage \times 2/3 at 125°C .
- (c) Duration : 2000h
- (d) Series resistance : do not exceed 3 ohms



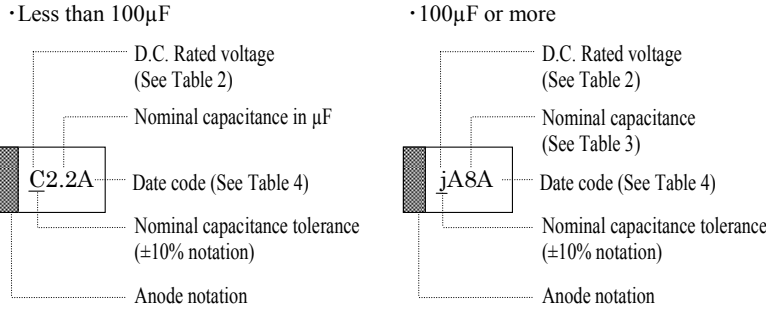
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TANTALUM CHIP CAPACITORS
TYPE 267 (Extended Capacitance Range)

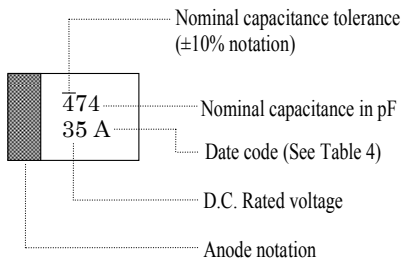
DRAWING No.		REVISION
121-0E267-001/50		27
TYPE	267	SHEET 6 OF 9

5. Marking

[A case]



[B case]



[C,C₃,D,D₃,H,E case]

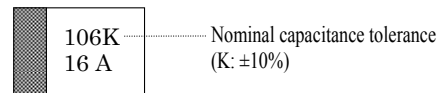


Table 2 Rated voltage codes

Rated voltage	2.5	4	6.3	10	16	20	25	35	50
code	e	g	j	A	C	D	E	V	H

Table 3 Nominal capacitance codes

Capacitance μF	100	150	220	330	470	680
Code	A8	E8	J8	N8	S8	W8

Table 4 Date codes

Year	Month	Code	Year	Month	Code	Year	Month	Code	Year	Month	Code
2017 2021	1	A	2018 2022	1	N	2019 2023	1	a	2020 2024	1	n
	2	B		2	P		2	b		2	p
	3	C		3	Q		3	c		3	q
	4	D		4	R		4	d		4	r
	5	E		5	S		5	e		5	s
	6	F		6	T		6	f		6	t
	7	G		7	U		7	g		7	u
	8	H		8	V		8	h		8	v
	9	J		9	W		9	J		9	w
	10	K		10	X		10	k		10	x
	11	L		11	Y		11	l		11	y
	12	M		12	Z		12	m		12	z

TANTALUM CHIP CAPACITORS
TYPE 267 (Extended Capacitance Range)

DRAWING No.		REVISION
121-0E267-001/50		27
TYPE	267	SHEET 7 OF 9

6. Taping Specification

6.1 Carrier Tape dimensions in mm

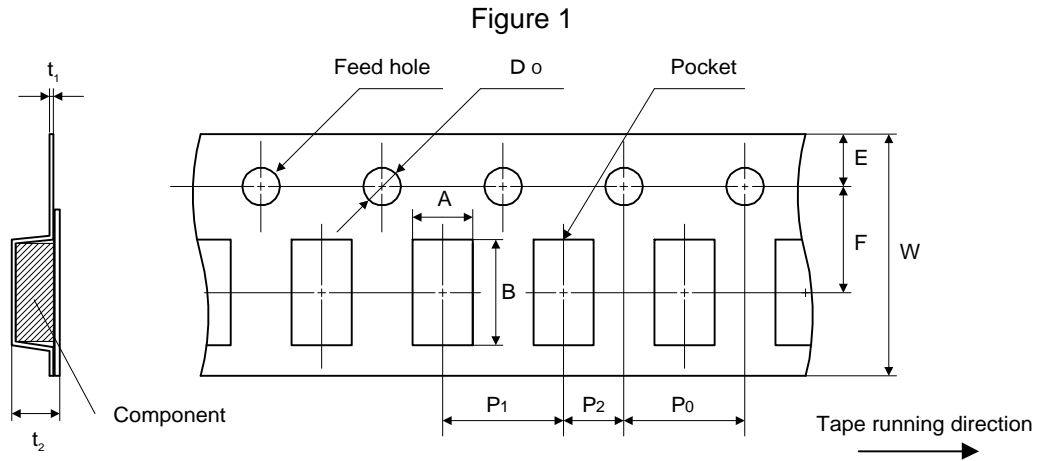


Table 5

Case Code	A ±0.1	B ±0.1	W ±0.3	F	E ±0.1	P ₁ ±0.1	P ₂ ±0.05	P ₀ ±0.1	D ₀ -0/+0.1	t ₁ max.	t ₂ max.
A	1.9	3.5	8.0	3.5 ±0.05	1.75	4.0	2.0	4.0	1.5	0.6	2.1
B	3.3	3.8	↓	↓	↓	↓	↓	↓	↓	↓	2.4
C	3.6	6.0	12.0	5.65 ±0.05	1.5	8.0	↓	↓	↓	↓	2.8
C ₃	3.7	6.4	↓	5.5 ±0.05	1.75	↓	↓	↓	↓	↓	3.1
D	4.9	6.0	↓	5.65 ±0.05	1.5	↓	↓	↓	↓	↓	3.8
D ₃	4.8	7.7	↓	5.7 ±0.05	1.5	↓	↓	↓	↓	↓	3.6
H	4.8	7.7	↓	5.7 ±0.1	1.5	↓	↓	↓	↓	↓	4.9
E	6.1	7.7	↓	5.5 ±0.05	1.75	↓	↓	↓	↓	↓	4.0



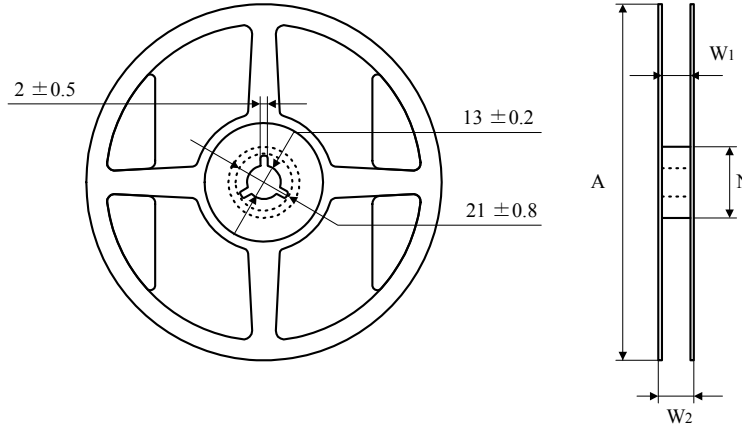
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TANTALUM CHIP CAPACITORS
TYPE 267 (Extended Capacitance Range)

DRAWING No.		REVISION
121-0E267-001/50		27
TYPE	267	SHEET 8 OF 9

6.2 Reel dimensions in mm

Figure 2



Note : Figure 2 is an example of 7" Reel.

Table 6

Reel	Case Code	A	N	W ₁ -0/+2	W ₂ max.	Quantity/Reel
7"Reel	A,B	180 -3/+0	60 -0/+1	8.4	14.4	2000 pcs
	C,C ₃ D,D ₃ ,H,E	↓	↓	12.4	18.4	500 pcs
13"Reel	A	330 ±2	80 ±1	8.4	14.4	9000 pcs
	B	↓	↓	↓	↓	8000 pcs
	C,C ₃	↓	100 ±1	12.4	18.4	3000 pcs
	D,D ₃	↓	↓	↓	↓	2500 pcs
	H	↓	↓	↓	↓	1500 pcs
	E	↓	↓	↓	↓	2000 pcs



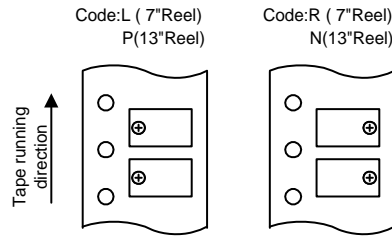
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TANTALUM CHIP CAPACITORS TYPE 267 (Extended Capacitance Range)

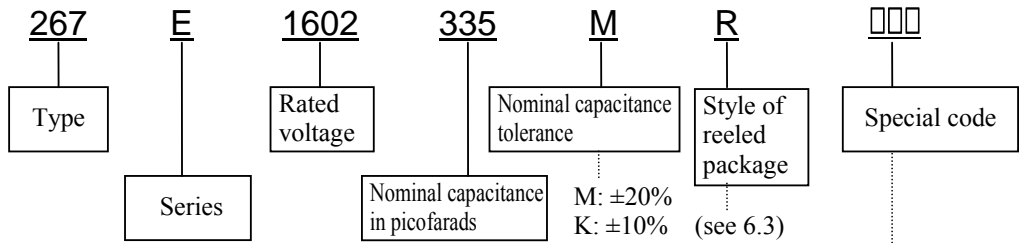
DRAWING No.		REVISION
121-0E267-001/50		27
TYPE	267	SHEET 9 OF 9

6.3 Orientation

Figure 3



7. Catalog Numbering System



533,534,535:Semi extended range
720,734,735:Case code C₃,D₃,E



267161210

TANTALUM CHIP CAPACITORS TYPE 267 [EXTENDED CAPACITANCE RANGE]	DRAWING No.	REVISION
	122-0E267-001/518	
TYPE 267	SHEET 1 OF 2	

1. Scope

This specification specifies ratings and dimension of polarized tantalum solid electrolytic capacitors type 267 (Extended capacitance range).

2. Dimensions in mm

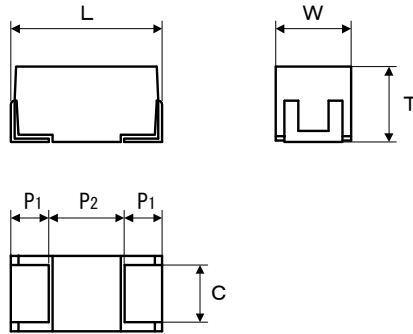


Table 1

Case Code	EIA Code	L ±0.2	W ±0.2	T ±0.2	P ₁ ±0.2	P ₂ min.	C ±0.1
A	3216	3.2	1.6	1.6	0.75	1.4	1.2

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