# SOLID TANTALUM ELECTROLYTIC CAPACITORS

nichicon

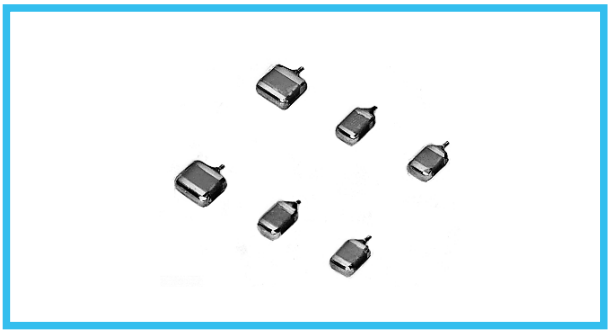
# F95 Conformal coated Chip

FRAMELESS™

For SMD | Smaller | For High Frequency

Upgrade

● Compliant to the RoHS directive (2002/95/EC).



## ■Applications

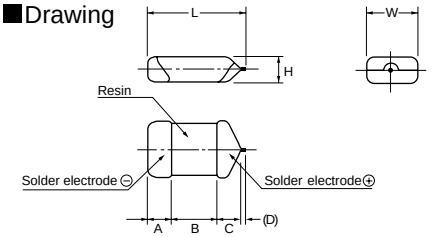
- ●Smartphone
- ●Wireless module
- ●Tablet PC
- ●e-book

## ■Type numbering system (Example : 4V 330µF)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F | 9 | 5 | 0 | G | 3 | 3 | 7 | M | A | | A | Q | 2 |

- Single face electrode
- Taping code (Refer to page 333 for details)
- Case code
- Capacitance tolerance
- Rated capacitance
- Rated voltage
- Series

## ■Drawing




Single-side electrodes
(Both electrodes at bottom side only)

## ■ Dimensions

(mm)

| Case code | L | W | H | A | B | C | ( D ) |
|---|---|---|---|---|---|---|---|
| R | 2.2 ± 0.3 | 1.25 ± 0.3 | 0.65MAX. | 0.6 ± 0.3 | 0.8 ± 0.3 | 0.5MIN | (0.2) |
| P | 2.2 ± 0.3 | 1.25 ± 0.3 | 1.0 ± 0.2 | 0.6 ± 0.3 | 0.8 ± 0.3 | 0.8 ± 0.3 | (0.2) |
| Q | 3.2 ± 0.2 | 1.6 ± 0.2 | 0.8 ± 0.2 | 0.8 ± 0.2 | 1.2 ± 0.2 | 0.8 ± 0.2 | (0.2) |
| S | 3.2 ± 0.3 | 1.6 ± 0.3 | 1.0 ± 0.2 | 0.8 ± 0.3 | 1.2 ± 0.3 | 0.8 ± 0.3 | (0.2) |
| A | 3.2 ± 0.3 | 1.7 ± 0.3 | 1.4 ± 0.2 | 0.8 ± 0.3 | 1.2 ± 0.3 | 0.8 ± 0.3 | (0.2) |
| T | 3.5 ± 0.2 | 2.7 ± 0.2 | 1.0 ± 0.2 | 0.8 ± 0.2 | 1.2 ± 0.2 | 1.1 ± 0.2 | (0.2) |
| B | 3.5 ± 0.2 | 2.8 ± 0.2 | 1.8 ± 0.2 | 0.8 ± 0.3 | 1.2 ± 0.3 | 1.1 ± 0.3 | (0.2) |

D dimension only for reference

## ■Specifications

| Item | Performance Characteristics |
|---|---|
| Category Temperature Range | −55 to +125°C (Rated temperature : +85°C) |
| Capacitance Tolerance | ±20%, ±10% (at 120Hz) (However R・P Case ±20%) |
| Dissipation Factor (at 120Hz) | Refer to next page |
| ESR(100kHz) | Refer to next page |
| Leakage Current | Refer to next page<br>Provided that<br>• After 1 minute's application of rated voltage, leakage current at 85°C, 10 times or less than 20°C specified value.<br>• After 1 minute's application of rated voltage, leakage current at 125°C, 12.5 times or less than 20°C specified value. |
| Capacitance Change by Temperature | +15% Max. (at +125°C)<br>+10% Max. (at +85°C)<br>−10% Max. (at −55°C) |
| Damp Heat (Steady State) | At 40°C, 90 to 95% R.H., For 500 hours (No voltage applied)<br>Capacitance Change ····· Refer to next page (*1)<br>Dissipation Factor ····· Initial specified value or less<br>Leakage Current ····· Initial specified value or less |
| Temperature Cycles | At −55°C / +125°C, 30 minutes each, For 5 cycles,<br>Capacitance Change ····· Refer to next page (*1)<br>Dissipation Factor ····· Initial specified value or less<br>Leakage Current ····· Initial specified value or less |
| Resistance to Soldering Heat | 10 seconds reflow at 260°C, 10 seconds immersion at 260°C<br>Capacitance Change ····· Refer to next page (*1)<br>Dissipation Factor ····· Initial specified value or less<br>Leakage Current ····· Initial specified value or less |
| Surge* | After application of surge voltage in series with a 33Ω resistor at the rate of 30 seconds ON, 30 seconds OFF, for 1000 successive test cycles at 85°C, capacitors shall meet the characteristic requirements table below.<br>Capacitance Change ····· Refer to next page (*1)<br>Dissipation Factor ····· Initial specified value or less<br>Leakage Current ····· Initial specified value or less |
| Endurance* | After 2000 hours' application of rated voltage at 85°C, capacitors shall meet the characteristic requirements table below.<br>Capacitance Change ····· Refer to next page (*1)<br>Dissipation Factor ····· Initial specified value or less<br>Leakage Current ····· Initial specified value or less |
| Shear Test | After applying the pressure load of 5N for 10±1 seconds horizontally to the center of capacitor side body which has no electrode and has been soldered beforehand on a substrate, there shall be found neither exfoliation nor its sign at the terminal electrode.<br>5N (0.51kg・f)<br>For 10 ± 1 seconds |
| Terminal Strength | Keeping a capacitor surface-mounted on a substrate upside down and supporting the substrate at both of the opposite bottom points 45mm apart from the center of capacitor, the pressure strength is applied with a specified jig at the center of substrate so that the substrate may bend by 1mm as illustrated. Then, there shall be found no remarkable abnormality on the capacitor terminals.<br>R230 20 1mm 45 45 |

* As for the surge voltage, refer to page 332 for details.

## ■ Standard Ratings

| Cap. (µF) \ V | Code | 4 | 6.3 | 10 | 16 | 20 | 25 | 35 |
|---|---|---|---|---|---|---|---|---|
| | | 0G | 0J | 1A | 1C | 1D | 1E | 1V |
| 1 | 105 | | | | | | R | P・S |
| 1.5 | 155 | | | | | | | |
| 2.2 | 225 | | | | | P | R・P | A |
| 3.3 | 335 | | | | | | | |
| 4.7 | 475 | | | | R・P | S・A | P・Q・S・A | B |
| 6.8 | 685 | | | | | | (Q)・(S) | |
| 10 | 106 | | | R・P | P・Q・S・A | S・A・B | A・(T)・B | |
| 15 | 156 | | | P | S・A | | | |
| 22 | 226 | | R | P・Q・S・A | Q・S・A・T・B | B | | |
| 33 | 336 | | (R)・P | P・Q・S・A | (A)・T・B | | | |
| 47 | 476 | (R) | P | P・(Q)・S・A・T・B | B | | | |
| 68 | 686 | | P | B | | | | |
| 100 | 107 | P・S・A | P・Q・S・A・T・B | (S)・A・T・B | | | | |
| 150 | 157 | P・B | B | | | | | |
| 220 | 227 | (P)・Q・S・A・T・B | (S)・(A)・(T)・B | | | | | |
| 330 | 337 | (P)・(S)・A・T・B | B | | | | | |
| 470 | 477 | (P)・(A)・(T)・B | (B) | | | | | |
| 680 | 687 | (T) | | | | | | |

( ) The series in parentheses are being developed.

Please contact to your local Nichicon sales office when these series are being designed in your application.

# F95

## ■ Standard Ratings

| Rated Volt | Rated Capacitance (μF) | Case code | Part Number | *2 Leakage Current (μA) | Disspation Factor (%@120Hz) | ESR (Ω@100kHz) | *1 ΔC/C (%) |
|---|---|---|---|---|---|---|---|
| 4V | 100 | P | F950G107MPAAQ2 | 4.0 | 30 | 1.2 | ±15 |
| | 100 | S | F950G107MSAAQ2 | 4.0 | 14 | 0.8 | * |
| | 100 | A | F950G107MAAAQ2 | 4.0 | 12 | 0.5 | * |
| | 150 | P | F950G157MPAAQ2 | 12.0 | 31 | 1.1 | ±20 |
| | 150 | B | F950G157MBAAQ2 | 6.0 | 14 | 0.4 | * |
| | 220 | Q | F950G227MQAAQ2 | 8.8 | 30 | 1.5 | ±20 |
| | 220 | S | F950G227MSAAQ2 | 8.8 | 30 | 0.8 | ±15 |
| | 220 | A | F950G227MAAAQ2 | 8.8 | 25 | 0.8 | ±15 |
| | 220 | T | F950G227MTAAQ2 | 8.8 | 25 | 0.6 | * |
| | 220 | B | F950G227MBAAQ2 | 8.8 | 16 | 0.4 | * |
| | 330 | A | F950G337MAAAQ2 | 13.2 | 40 | 0.8 | ±20 |
| | 330 | T | F950G337MTAAQ2 | 13.2 | 40 | 0.8 | ±20 |
| | 330 | B | F950G337MBAAQ2 | 13.2 | 30 | 0.6 | ±15 |
| | 470 | B | F950G477MBAAQ2 | 18.8 | 40 | 0.4 | ±20 |
| 6.3V | 22 | R | F950J226MRAAQ2 | 1.4 | 20 | 2.0 | ±20 |
| | 33 | P | F950J336MPAAQ2 | 2.1 | 14 | 1.1 | * |
| | 47 | P | F950J476MPAAQ2 | 3.0 | 20 | 1.1 | ±15 |
| | 68 | P | F950J686MPAAQ2 | 4.3 | 25 | 1.2 | ±15 |
| | 100 | P | F950J107MPAAQ2 | 12.6 | 35 | 1.2 | ±20 |
| | 100 | Q | F950J107MQAAQ2 | 6.3 | 30 | 1.1 | ±20 |
| | 100 | S | F950J107MSAAQ2 | 6.3 | 20 | 0.9 | ±15 |
| | 100 | A | F950J107MAAAQ2 | 6.3 | 14 | 0.5 | * |
| | 100 | T | F950J107MTAAQ2 | 6.3 | 14 | 0.6 | * |
| | 100 | B | F950J107MBAAQ2 | 6.3 | 14 | 0.4 | * |
| | 150 | B | F950J157MBAAQ2 | 9.5 | 18 | 0.4 | * |
| | 220 | B | F950J227MBAAQ2 | 13.9 | 30 | 0.4 | * |
| | 330 | B | F950J337MBAAQ2 | 20.8 | 35 | 0.6 | ±20 |
| 10V | 10 | R | F951A106MRAAQ2 | 1.0 | 18 | 3.0 | ±20 |
| | 10 | P | F951A106MPAAQ2 | 1.0 | 8 | 3.0 | * |
| | 15 | P | F951A156MPAAQ2 | 1.5 | 10 | 3.0 | * |
| | 22 | P | F951A226MPAAQ2 | 2.2 | 14 | 3.0 | * |
| | 22 | Q | F951A226MQAAQ2 | 2.2 | 10 | 2.0 | * |
| | 22 | S | F951A226MSAAQ2 | 2.2 | 10 | 1.1 | * |
| | 22 | A | F951A226MAAAQ2 | 2.2 | 6 | 0.9 | * |
| | 33 | P | F951A336MPAAQ2 | 3.3 | 20 | 3.0 | ±15 |
| | 33 | Q | F951A336MQAAQ2 | 3.3 | 18 | 3.0 | ±15 |
| | 33 | S | F951A336MSAAQ2 | 3.3 | 10 | 1.1 | * |
| | 33 | A | F951A336MAAAQ2 | 3.3 | 10 | 0.8 | * |
| | 47 | P | F951A476MPAAQ2 | 4.7 | 30 | 3.0 | ±20 |
| | 47 | S | F951A476MSAAQ2 | 4.7 | 14 | 1.1 | ±15 |
| | 47 | A | F951A476MAAAQ2 | 4.7 | 10 | 0.8 | * |
| | 47 | T | F951A476MTAAQ2 | 4.7 | 12 | 0.8 | * |
| | 47 | B | F951A476MBAAQ2 | 4.7 | 8 | 0.4 | * |
| | 68 | B | F951A686MBAAQ2 | 6.8 | 12 | 0.4 | * |
| | 100 | A | F951A107MAAAQ2 | 10.0 | 35 | 1.0 | ±15 |
| | 100 | T | F951A107MTAAQ2 | 10.0 | 20 | 0.6 | ±15 |
| | 100 | B | F951A107MBAAQ2 | 10.0 | 14 | 0.4 | * |

| Rated Volt | Rated Capacitance (μF) | Case code | Part Number | *2 Leakage Current (μA) | Disspation Factor (%@120Hz) | ESR (Ω@100kHz) | *1 ΔC/C (%) |
|---|---|---|---|---|---|---|---|
| 16V | 4.7 | R | F951C475MRAAQ2 | 0.8 | 12 | 6.0 | ±20 |
| | 4.7 | P | F951C475MPAAQ2 | 0.8 | 10 | 4.0 | * |
| | 10 | P | F951C106MPAAQ2 | 1.6 | 10 | 4.0 | * |
| | 10 | Q | F951C106MQAAQ2 | 1.6 | 8 | 3.0 | * |
| | 10 | S | F951C106MSAAQ2 | 1.6 | 8 | 2.0 | * |
| | 10 | A | F951C106MAAAQ2 | 1.6 | 6 | 1.4 | * |
| | 15 | S | F951C156MSAAQ2 | 2.4 | 8 | 2.0 | * |
| | 15 | A | F951C156MAAAQ2 | 2.4 | 8 | 1.4 | * |
| | 22 | Q | F951C226MQAAQ2 | 3.5 | 12 | 3.0 | * |
| | 22 | S | F951C226MSAAQ2 | 3.5 | 10 | 2.0 | ±15 |
| | 22 | A | F951C226MAAAQ2 | 3.5 | 8 | 1.4 | * |
| | 22 | T | F951C226MTAAQ2 | 3.5 | 8 | 1.4 | * |
| | 22 | B | F951C226MBAAQ2 | 3.5 | 6 | 0.5 | * |
| | 33 | T | F951C336MTAAQ2 | 5.3 | 11 | 1.5 | ±10 |
| | 33 | B | F951C336MBAAQ2 | 5.3 | 8 | 0.5 | * |
| | 47 | B | F951C476MBAAQ2 | 7.5 | 10 | 0.6 | * |
| 20V | 2.2 | P | F951D225MPAAQ2 | 0.5 | 6 | 6.0 | * |
| | 4.7 | S | F951D475MSAAQ2 | 0.9 | 8 | 4.0 | * |
| | 4.7 | A | F951D475MAAAQ2 | 0.9 | 6 | 1.5 | * |
| | 10 | S | F951D106MSAAQ2 | 2.0 | 10 | 4.0 | ±10 |
| | 10 | A | F951D106MAAAQ2 | 2.0 | 8 | 1.5 | * |
| | 10 | B | F951D106MBAAQ2 | 2.0 | 6 | 0.8 | * |
| | 22 | B | F951D226MBAAQ2 | 4.4 | 8 | 0.8 | * |
| 25V | 1 | R | F951E105MRAAQ2 | 0.5 | 10 | 10.0 | ±10 |
| | 2.2 | R | F951E225MRAAQ2 | 0.6 | 15 | 15.0 | ±20 |
| | 2.2 | P | F951E225MPAAQ2 | 0.6 | 8 | 6.0 | ±15 |
| | 4.7 | P | F951E475MPAAQ2 | 1.2 | 10 | 8.0 | ±15 |
| | 4.7 | Q | F951E475MQAAQ2 | 1.2 | 10 | 4.0 | ±15 |
| | 4.7 | S | F951E475MSAAQ2 | 1.2 | 8 | 4.0 | * |
| | 4.7 | A | F951E475MAAAQ2 | 1.2 | 8 | 2.0 | * |
| | 10 | A | F951E106MAAAQ2 | 2.5 | 12 | 2.0 | ±15 |
| | 10 | B | F951E106MBAAQ2 | 2.5 | 6 | 0.9 | * |
| 35V | 1 | P | F951V105MPAAQ2 | 0.5 | 8 | 10.0 | ±10 |
| | 1 | S | F951V105MSAAQ2 | 0.5 | 6 | 8.0 | * |
| | 2.2 | A | F951V225MAAAQ2 | 0.8 | 6 | 4.4 | * |
| | 4.7 | B | F951V475MBAAQ2 | 1.7 | 6 | 1.6 | * |

※ In case of capacitance tolerance ±10% type, K will be put at 9th digit of type numbering system.

*1 : ΔC/C Marked "*"

| Item | P・Q・S・A・T・B Case (%) |
|---|---|
| Damp Heat | ±10 |
| Tempereature cycles | ±5 |
| Resistance soldering heat | ±5 |
| Surge | ±5 |
| Endurance | ±10 |

*2 : Leakage Current After 1 minute's application of rated voltage, leakage current at 20˚C.

Стандарт Электрон Связь

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