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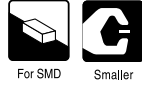
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# SOLID TANTALUM ELECTROLYTIC CAPACITORS

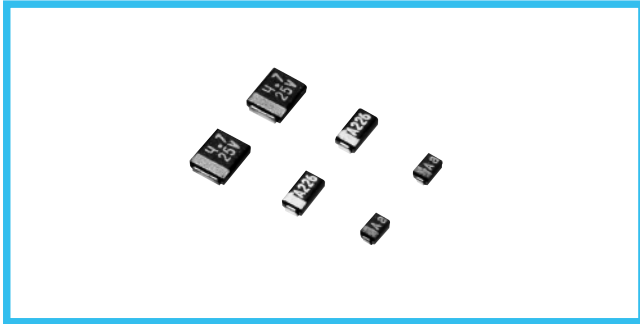


## F92

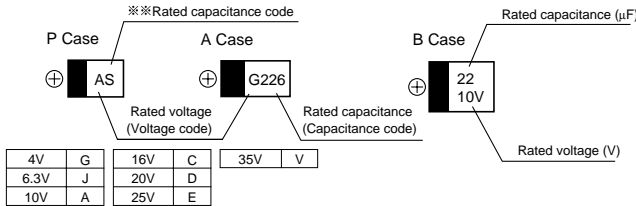
Resin-molded Chip,  
Compact Series



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



### Marking



※ ※ Capacitance code of "P" case products are as shown below.

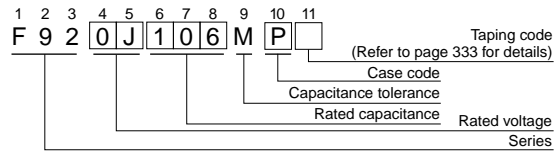
### Specifications

| Item                              | Performance Characteristics   |   |
|-----------------------------------|---|---|
|                                   | P Case  | A · B Case  |
| Category                          | P Case  |   |
| Temperature Range                 | -55 to +125°C (Rated temperature : +85°C)   |   |
| Capacitance Tolerance             | ±20% (at 120Hz)   |   |
| Dissipation Factor (120Hz)        | Refer to Next Page  |   |
| ESR (100kHz)                      | Refer to Next Page  |   |
| Leakage Current                   | <ul style="list-style-type: none"> <li>After 1 minute's application of rated voltage, leakage current at 20°C is not more than 0.01CV or 0.5µA, whichever is greater.</li> <li>After 1 minute's application of rated voltage, leakage current at 85°C is not more than 0.1CV or 5µA, whichever is greater.</li> <li>After 1 minute's application of derated voltage, leakage current at 125°C is not more than 0.125CV or 6.3µA, whichever is greater.</li> </ul> |   |
| Capacitance Change by Temperature | +20% Max. (at +125°C)<br>+15% Max. (at +85°C)<br>-15% Max. (at -55°C)   | +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. 500 hours (No voltage applied)   |   |
|                                   | Capacitance Change... Refer to next page (*1)<br>Dissipation Factor...150% or less than the initial specified value<br>Leakage Current... Initial specified value or less   | Refer to next page (*1)<br>Initial specified value or less<br>Initial specified value or less |
| Temperature Cycles                | -55°C / +125°C 30 minutes each 5 cycles   |   |
|                                   | Capacitance Change... Refer to next page (*1)<br>Dissipation Factor...150% or less than the initial specified value<br>Leakage Current... Initial specified value or less   | Refer to next page (*1)<br>Initial specified value or less<br>Initial specified value or less |

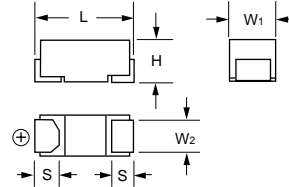
### Standard Ratings

| Cap. (µF) | V   |             |         |       |             |         |       |    | ※ ※ Capacitance code |
|-----------|-----|-------------|---------|-------|-------------|---------|-------|----|----------------------|
|           | 4   | 6.3         | 10      | 16    | 20          | 25      | 35    | 1V |                      |
| 0.22      | 224 |             |         |       |             |         |       | A  | J                    |
| 0.33      | 334 |             |         |       |             |         |       | A  | N                    |
| 0.47      | 474 |             |         |       | P           | P · A   | A     | A  | S                    |
| 0.68      | 684 |             |         |       | P           | A       |       | A  | W                    |
| 1         | 105 |             |         | P     | P           | P · A   | P · A | A  | A                    |
| 1.5       | 155 |             |         | P     | P           | A       |       | A  | E                    |
| 2.2       | 225 |             | P       | P     | P · A       | (P) · A | A · B | B  | J                    |
| 3.3       | 335 | P           | P       | P · A | A           |         |       | B  | N                    |
| 4.7       | 475 | P           | P       | P · A | (P) · A · B | A · B   | A · B |    | S                    |
| 6.8       | 685 | P           | P       | P · A | B           |         |       |    | w                    |
| 10        | 106 | P · A       | P · A   | P · A | A · B       | B       |       |    | a                    |
| 15        | 156 | P           | P · A   | A     |             |         |       |    | e                    |
| 22        | 226 | P · A       | P · A   | A · B | B           |         |       |    | J                    |
| 33        | 336 | P · A       | A · B   | B     |             |         |       |    | n                    |
| 47        | 476 | (P) · A · B | A · B   | B     |             |         |       |    | s                    |
| 68        | 686 | A · B       |         |       |             |         |       |    |                      |
| 100       | 107 | A · B       | (A) · B |       |             |         |       |    |                      |
| 150       | 157 | B           |         |       |             |         |       |    |                      |
| 220       | 227 | (B)         |         |       |             |         |       |    |                      |

### Type numbering system (Example: 6.3V 10µF)



### Drawing



### Dimensions

| Case code | L         | W <sub>1</sub> | W <sub>2</sub> | H         | S         |
|-----------|-----------|----------------|----------------|-----------|-----------|
| P         | 2.0 ± 0.2 | 1.25 ± 0.1     | 0.9 ± 0.1      | 1.1 ± 0.1 | 0.5 ± 0.2 |
| A         | 3.2 ± 0.2 | 1.6 ± 0.2      | 1.2 ± 0.1      | 1.1 ± 0.1 | 0.8 ± 0.2 |
| B         | 3.4 ± 0.2 | 2.8 ± 0.2      | 2.3 ± 0.1      | 1.1 ± 0.1 | 0.8 ± 0.2 |

|                              |  |   |  |
|------------------------------|--|---|--|
| Resistance to Soldering Heat | 10 seconds reflow at 260°C, 5 seconds immersion at 260°C   | Capacitance Change... Refer to next page (*1)<br>Dissipation Factor...150% of less than the initial specified value<br>Leakage Current... Initial specified value or less | Refer to next page (*1)<br>Initial specified value or less<br>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.   | Capacitance Change... Refer to next page (*1)<br>Dissipation Factor...150% or less than the initial specified value<br>Leakage Current... Initial specified value or less | Refer to next page (*1)<br>Initial specified value or less<br>Initial specified value or less  |
| Endurance*                   | After 2000hours' application of rated voltage in series with a 3Ω resistor at 85°C, or derated voltage in series with a 3Ω resistor at 125°C, capacitors shall meet the characteristic requirements table below.   | Capacitance Change... Refer to next page (*1)<br>Dissipation Factor...150% or less than the initial specified value<br>Leakage Current... Initial specified value or less | After 2000hours' application of rated voltage in series with a 3Ω resistor at 85°C, or derated voltage in series with a 3Ω resistor at 125°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.   |   | <p>5N (0.51kg · f)<br/>For 10 ± 1 seconds</p>  |
| 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. |   | <p>20<br/>45 45<br/>1mm</p>  |

\* As for the surge and derated voltage at 125°C, refer to page 332 for details.

( ) The series in parentheses are being developed. Please contact to your local Nichicon sales office when these series are being designed in your application.

CAT.8100B

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### Standard Ratings

| Rated Volt | Rated Capacitance (μF) | Case code | Part Number | Leakage Current (μA) | Dissipation Factor (%@120Hz) | ESR (sΩ@100kHz) | *1 ΔC/C (%) |   |
|------------|------------------------|-----------|-------------|----------------------|------------------------------|-----------------|-------------|---|
| 4V         | 3.3                    | P         | F920G335MPA | 0.5                  | 8                            | 12.0            | *           |   |
|            | 4.7                    | P         | F920G475MPA | 0.5                  | 8                            | 6.0             | *           |   |
|            | 6.8                    | P         | F920G685MPA | 0.5                  | 10                           | 6.0             | *           |   |
|            | 10                     | P         | F920G106MPA | 0.5                  | 10                           | 6.0             | *           |   |
|            | 10                     | A         | F920G106MAA | 0.5                  | 8                            | 4.0             | *           |   |
|            | 15                     | P         | F920G156MPA | 0.6                  | 10                           | 5.0             | *           |   |
|            | 22                     | P         | F920G226MPA | 0.9                  | 20                           | 5.0             | *           |   |
|            | 22                     | A         | F920G226MAA | 0.9                  | 12                           | 2.8             | *           |   |
|            | 33                     | P         | F920G336MPA | 1.3                  | 20                           | 4.0             | *           |   |
|            | 33                     | A         | F920G336MAA | 1.3                  | 12                           | 2.8             | *           |   |
|            | 47                     | A         | F920G476MAA | 1.9                  | 18                           | 2.8             | *           |   |
|            | 47                     | B         | F920G476MBA | 1.9                  | 12                           | 1.7             | *           |   |
|            | 68                     | A         | F920G686MAA | 2.7                  | 25                           | 2.8             | ±15         |   |
|            | 68                     | B         | F920G686MBA | 2.7                  | 18                           | 1.5             | *           |   |
|            | 100                    | A         | F920G107MAA | 4.0                  | 30                           | 2.8             | ±15         |   |
|            | 100                    | B         | F920G107MBA | 4.0                  | 18                           | 1.3             | *           |   |
|            | 150                    | B         | F920G157MBA | 6.0                  | 25                           | 1.3             | ±15         |   |
|            | 6.3V                   | 2.2       | P           | F920J225MPA          | 0.5                          | 8               | 12.0        | * |
| 3.3        |                        | P         | F920J335MPA | 0.5                  | 8                            | 12.0            | *           |   |
| 4.7        |                        | P         | F920J475MPA | 0.5                  | 8                            | 6.0             | *           |   |
| 6.8        |                        | P         | F920J685MPA | 0.5                  | 10                           | 6.0             | *           |   |
| 10         |                        | P         | F920J106MPA | 0.6                  | 10                           | 6.0             | *           |   |
| 10         |                        | A         | F920J106MAA | 0.6                  | 8                            | 4.0             | *           |   |
| 15         |                        | P         | F920J156MPA | 0.9                  | 10                           | 6.0             | *           |   |
| 15         |                        | A         | F920J156MAA | 0.9                  | 8                            | 4.0             | *           |   |
| 22         |                        | P         | F920J226MPA | 1.4                  | 20                           | 5.0             | *           |   |
| 22         |                        | A         | F920J226MAA | 1.4                  | 12                           | 2.8             | *           |   |
| 33         |                        | A         | F920J336MAA | 2.1                  | 12                           | 2.8             | *           |   |
| 33         |                        | B         | F920J336MBA | 2.1                  | 12                           | 1.7             | *           |   |
| 47         |                        | A         | F920J476MAA | 3.0                  | 18                           | 2.8             | ±15         |   |
| 47         |                        | B         | F920J476MBA | 3.0                  | 12                           | 1.7             | *           |   |
| 100        |                        | B         | F920J107MBA | 6.3                  | 20                           | 1.3             | ±15         |   |
| 10V        |                        | 1         | P           | F921A105MPA          | 0.5                          | 8               | 12.0        | * |
|            |                        | 1.5       | P           | F921A155MPA          | 0.5                          | 8               | 12.0        | * |
|            |                        | 2.2       | P           | F921A225MPA          | 0.5                          | 8               | 12.0        | * |
|            | 3.3                    | P         | F921A335MPA | 0.5                  | 8                            | 12.0            | *           |   |
|            | 3.3                    | A         | F921A335MAA | 0.5                  | 6                            | 7.0             | *           |   |
|            | 4.7                    | P         | F921A475MPA | 0.5                  | 8                            | 6.0             | *           |   |
|            | 4.7                    | A         | F921A475MAA | 0.5                  | 6                            | 4.0             | *           |   |
|            | 6.8                    | P         | F921A685MPA | 0.7                  | 8                            | 6.0             | *           |   |
|            | 6.8                    | A         | F921A685MAA | 0.7                  | 6                            | 4.0             | *           |   |
|            | 10                     | P         | F921A106MPA | 1.0                  | 14                           | 6.0             | *           |   |
|            | 10                     | A         | F921A106MAA | 1.0                  | 8                            | 4.0             | *           |   |
|            | 15                     | A         | F921A156MAA | 1.5                  | 8                            | 4.0             | *           |   |
|            | 22                     | A         | F921A226MAA | 2.2                  | 14                           | 4.0             | ±15         |   |
|            | 22                     | B         | F921A226MBA | 2.2                  | 8                            | 1.9             | *           |   |
|            | 33                     | B         | F921A336MBA | 3.3                  | 12                           | 1.9             | *           |   |
|            | 47                     | B         | F921A476MBA | 4.7                  | 18                           | 1.9             | ±15         |   |
|            | 16V                    | 0.47      | P           | F921C474MPA          | 0.5                          | 8               | 20.0        | * |
|            |                        | 0.68      | P           | F921C684MPA          | 0.5                          | 8               | 12.0        | * |
| 1          |                        | P         | F921C105MPA | 0.5                  | 8                            | 12.0            | *           |   |
| 1.5        |                        | P         | F921C155MPA | 0.5                  | 8                            | 12.0            | *           |   |
| 2.2        |                        | P         | F921C225MPA | 0.5                  | 8                            | 12.0            | *           |   |
| 2.2        |                        | A         | F921C225MAA | 0.5                  | 6                            | 7.0             | *           |   |
| 3.3        |                        | A         | F921C335MAA | 0.5                  | 6                            | 7.0             | *           |   |
| 4.7        |                        | A         | F921C475MAA | 0.8                  | 6                            | 7.0             | *           |   |
| 4.7        |                        | B         | F921C475MBA | 0.8                  | 6                            | 3.0             | *           |   |
| 6.8        |                        | B         | F921C685MBA | 1.1                  | 6                            | 3.0             | *           |   |
| 10         |                        | A         | F921C106MAA | 1.6                  | 8                            | 7.0             | ±15         |   |
| 10         |                        | B         | F921C106MBA | 1.6                  | 6                            | 2.0             | *           |   |
| 22         |                        | B         | F921C226MBA | 3.5                  | 12                           | 2.0             | ±15         |   |

| Rated Volt | Rated Capacitance (μF) | Case code | Part Number | Leakage Current (μA) | Dissipation Factor (%@120Hz) | ESR (sΩ@100kHz) | *1 ΔC/C (%) |
|------------|------------------------|-----------|-------------|----------------------|------------------------------|-----------------|-------------|
| 20V        | 0.47                   | P         | F921D474MPA | 0.5                  | 8                            | 20.0            | *           |
|            | 0.47                   | A         | F921D474MAA | 0.5                  | 4                            | 10.0            | *           |
|            | 0.68                   | A         | F921D684MAA | 0.5                  | 4                            | 10.0            | *           |
|            | 1                      | P         | F921D105MPA | 0.5                  | 8                            | 20.0            | *           |
|            | 1                      | A         | F921D105MAA | 0.5                  | 4                            | 10.0            | *           |
|            | 1.5                    | A         | F921D155MAA | 0.5                  | 6                            | 7.4             | *           |
|            | 2.2                    | A         | F921D225MAA | 0.5                  | 6                            | 7.0             | *           |
|            | 4.7                    | A         | F921D475MAA | 0.9                  | 10                           | 7.0             | ±10         |
|            | 4.7                    | B         | F921D475MBA | 0.9                  | 6                            | 3.0             | *           |
|            | 10                     | B         | F921D106MBA | 2.0                  | 8                            | 3.0             | ±10         |
| 25V        | 1                      | P         | F921E105MPA | 0.5                  | 8                            | 20.0            | *           |
|            | 1                      | A         | F921E105MAA | 0.5                  | 6                            | 10.0            | *           |
|            | 2.2                    | A         | F921E225MAA | 0.6                  | 8                            | 10.0            | ±15         |
|            | 2.2                    | B         | F921E225MBA | 0.6                  | 6                            | 4.0             | *           |
|            | 4.7                    | A         | F921E475MAA | 1.2                  | 10                           | 7.0             | ±10         |
|            | 4.7                    | B         | F921E475MBA | 1.2                  | 6                            | 3.0             | *           |
| 35V        | 0.22                   | A         | F921V224MAA | 0.5                  | 4                            | 10.0            | *           |
|            | 0.33                   | A         | F921V334MAA | 0.5                  | 4                            | 10.0            | *           |
|            | 0.47                   | A         | F921V474MAA | 0.5                  | 4                            | 10.0            | *           |
|            | 1                      | A         | F921V105MAA | 0.5                  | 6                            | 10.0            | *           |
|            | 2.2                    | B         | F921V225MBA | 0.8                  | 6                            | 4.0             | ±10         |
|            | 3.3                    | B         | F921V335MBA | 1.2                  | 10                           | 4.0             | ±10         |

\*1 : ΔC/C Marked "\*"

| Item                      | P Case (%) | A , B Case(%) |
|---------------------------|------------|---------------|
| Damp Heat                 | ±20        | ±10           |
| Temperature cycles        | ±10        | ± 5           |
| Resistance soldering heat | ±10        | ± 5           |
| Surge                     | ±10        | ± 5           |
| Endurance                 | ±10        | ±10           |

We can consider the type of compliance to AEC-Q200. Please contact to your local Nichicon sales office when these series are being designed in your application.