



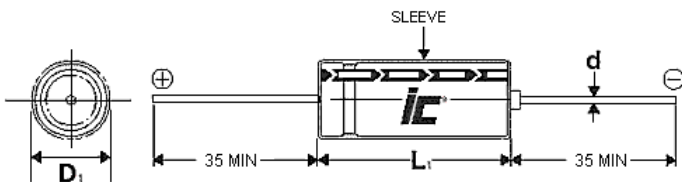
### FEATURES

Axial Lead - High Voltage

### APPLICATIONS

Filtering - Bypass - Coupling - Blocking

|   |                       |  |                                  |      |                                       |      |      |                        |                         |     |                      |     |     |  |
|---|-----------------------|--|----------------------------------|------|---------------------------------------|------|------|------------------------|-------------------------|-----|----------------------|-----|-----|--|
| <b>Operating Temperature Range</b>                        |                       | <b>-40°C to +85°C (10 to 350 WVDC)</b><br><b>-25°C to +85°C (450 WVDC)</b> |                                  |      |                                       |      |      |                        |                         |     |                      |     |     |  |
| <b>Capacitance Tolerance</b>                              |                       | <b>+20% at 120 Hz, 20°C</b>  |                                  |      |                                       |      |      |                        |                         |     |                      |     |     |  |
| <b>Surge voltage</b>                                      | <b>WVDC</b>           | 10   | 16                               | 25   | 35                                    | 50   | 63   | 100                    | 160                     | 200 | 250                  | 350 | 450 |  |
|   | <b>SVDC</b>           | 13   | 20                               | 32   | 44                                    | 63   | 79   | 125                    | 200                     | 250 | 300                  | 400 | 500 |  |
| <b>Dissipation Factor</b>                                 | <b>WVDC</b>           | 10   | 16                               | 25   | 35                                    | 50   | 63   | 100                    | 160                     | 200 | 250                  | 350 | 450 |  |
|   | <b>Tan δ</b>          | .24  | .20                              | .16  | .14                                   | .12  | .1   | .1                     | .2                      | .2  | .2                   | .25 | .25 |  |
|   |                       | Add .02 for every 1000uF above 1000uF                                      |                                  |      |                                       |      |      |                        |                         |     |                      |     |     |  |
| <b>Leakage current</b>                                    |                       | <b>10 to 100 WVDC</b>  |                                  |      |                                       |      |      | <b>160 to 450 WVDC</b> |                         |     |                      |     |     |  |
|   |                       | <b>1 Minutes</b>   |                                  |      | <b>2 Minutes</b>                      |      |      | <b>1 Minute</b>        |                         |     | <b>1 Minute</b>      |     |     |  |
|   |                       | .03CV or 4uA,<br>Whichever is greater                                      |                                  |      | .01CV or 3uA,<br>Whichever is greater |      |      | CV≤1000<br>.04CV+100uA |                         |     | CV>1000<br>.1CV+40uA |     |     |  |
| <b>Low temperature stability Impedance ratio (120 Hz)</b> | <b>WVDC</b>           | 10   | 16                               | 25   | 35                                    | 50   | 63   | 100                    | 160                     | 200 | 250                  | 350 | 450 |  |
|   | <b>-25°C to +20°C</b> | 4  | 3                                | 2    | 2                                     | 2    | 2    | 2                      | 4                       | 4   | 4                    | 4   | 6   |  |
|   | <b>-40°C to +20°C</b> | 10   | 8                                | 5    | 4                                     | 3    | 3    | 3                      | 15                      | 15  | 15                   | 10  | -   |  |
| <b>Load Life</b>  |                       | <b>2000 hours at 85°C with rated WVDC and ripple current applied</b>       |                                  |      |                                       |      |      |                        |                         |     |                      |     |     |  |
|   |                       | <b>Capacitance change</b>  | ≤20% of initial measured value   |      |                                       |      |      |                        |                         |     |                      |     |     |  |
|   |                       | <b>Dissipation factor</b>  | ≤200% of maximum specified value |      |                                       |      |      |                        |                         |     |                      |     |     |  |
|   |                       | <b>Leakage current</b>   | ≤100% of maximum specified value |      |                                       |      |      |                        |                         |     |                      |     |     |  |
| <b>Shelf Life</b>   |                       | <b>1000 hours at 85°C with no voltage applied</b>                          |                                  |      |                                       |      |      |                        |                         |     |                      |     |     |  |
|   |                       | <b>Capacitance change</b>  | ≤20% of initial measured value   |      |                                       |      |      |                        |                         |     |                      |     |     |  |
|   |                       | <b>Dissipation factor</b>  | ≤200% of maximum specified value |      |                                       |      |      |                        |                         |     |                      |     |     |  |
|   |                       | <b>Leakage current</b>   | ≤100% of maximum specified value |      |                                       |      |      |                        |                         |     |                      |     |     |  |
| <b>Ripple Current Multipliers</b>                         |                       | <b>Capacitance</b>   | <b>Frequency (Hz)</b>            |      |                                       |      |      |                        | <b>Temperature (°C)</b> |     |                      |     |     |  |
|   |                       | <b>uF</b>  | 50                               | 120  | 400                                   | 1k   | 10k  | 50k                    | +85                     | +70 | +60                  | +30 |     |  |
|   |                       | <b>C≤10</b>  | .8                               | 1.0  | 1.3                                   | 1.45 | 1.65 | 1.7                    | 1.0                     | 1.3 | 1.5                  | 1.8 |     |  |
|   |                       | <b>10&lt;C≤100</b>   | .8                               | 1.0  | 1.23                                  | 1.36 | 1.48 | 1.53                   | 1.0                     | 1.3 | 1.5                  | 1.8 |     |  |
|   |                       | <b>100&lt;C≤1000</b>   | .8                               | 1.0  | 1.16                                  | 1.25 | 1.35 | 1.38                   | 1.0                     | 1.3 | 1.5                  | 1.8 |     |  |
| <b>C&gt;1000</b>  | .8                    | 1.0  | 1.11                             | 1.17 | 1.25                                  | 1.28 | 1.0  | 1.3                    | 1.5                     | 1.8 |                      |     |     |  |



|   |     |     |     |     |      |     |     |     |     |
|---|-----|-----|-----|-----|------|-----|-----|-----|-----|
| D | 5   | 6.3 | 8   | 10  | 12.5 | 16  | 18  | 22  | 25  |
| d | 0.5 | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 | 0.8 | 0.8 |
| B | 0.5 | 0.5 | 0.5 | 0.5 | 0.8  | 0.5 | 0.5 | 1.0 | 1.0 |

D ≤ 10mm, L<sub>1</sub> = L + 1.5mm Max.

D > 10mm, L<sub>1</sub> = L + 2mm Max.

D<sub>1</sub> = D + B Max.

# TTA

+85°C, Standard, General Purpose, 2000 hours

| WVDC | Capacitance (µF) | IC PART NUMBER | Maximum ESR (Ω) 120 Hz, +20°C | Maximum RMS Ripple Current (mA) 120 Hz, +85°C | Dims DxDL (mm) |
|------|------------------|----------------|-------------------------------|---|----------------|
| 10   | 100              | 107TTA010M     | 3.9789                        | 130   | 6.3x13         |
| 10   | 470              | 477TTA010M     | 0.8466                        | 350   | 8x16           |
| 10   | 1000             | 108TTA010M     | 0.3979                        | 570   | 10x21          |
| 10   | 2200             | 228TTA010M     | 0.211                         | 1100  | 13x26          |
| 10   | 3300             | 338TTA010M     | 0.131                         | 1435  | 13x31          |
| 10   | 4700             | 478TTA010M     | 0.1129                        | 1730  | 16x31          |
| 10   | 10000            | 109TTA010M     | 0.063                         | 2350  | 18x41          |
| 16   | 47               | 476TTA016M     | 7.0547                        | 90  | 5x13           |
| 16   | 68               | 686TTA016M     | 4.8761                        | 150   | 6.3x16         |
| 16   | 220              | 227TTA016M     | 1.5071                        | 260   | 8x16           |
| 16   | 330              | 337TTA016M     | 1.0048                        | 320   | 8x16           |
| 16   | 470              | 477TTA016M     | 0.7055                        | 450   | 8x20           |
| 16   | 1000             | 108TTA016M     | 0.3316                        | 700   | 10x26          |
| 16   | 2200             | 228TTA016M     | 0.1809                        | 1190  | 13x31          |
| 16   | 3300             | 338TTA016M     | 0.1306                        | 1610  | 16x31          |
| 16   | 4700             | 478TTA016M     | 0.0988                        | 1840  | 16x31.5        |
| 16   | 6800             | 688TTA016M     | 0.078                         | 2310  | 16x41          |
| 16   | 10000            | 109TTA016M     | 0.063                         | 2520  | 18x41          |
| 16   | 15000            | 159TTA016M     | 0.0531                        | 3310  | 22x51          |
| 16   | 22000            | 229TTA016M     | 0.0467                        | 3600  | 22x51          |
| 25   | 33               | 336TTA025M     | 8.0381                        | 80  | 5x13           |
| 25   | 47               | 476TTA025M     | 5.6438                        | 105   | 6.3x13         |
| 25   | 100              | 107TTA025M     | 2.6526                        | 170   | 6.3x13         |
| 25   | 150              | 157TTA025M     | 1.7684                        | 260   | 8x16           |
| 25   | 220              | 227TTA025M     | 1.2057                        | 280   | 8x16           |
| 25   | 330              | 337TTA025M     | 0.8038                        | 385   | 8x20           |
| 25   | 470              | 477TTA025M     | 0.5644                        | 560   | 10x21          |
| 25   | 1000             | 108TTA025M     | 0.2653                        | 830   | 10x26          |
| 25   | 1500             | 158TTA025M     | 0.1989                        | 1150  | 13x26          |
| 25   | 2200             | 228TTA025M     | 0.1507                        | 1480  | 16x31          |
| 25   | 3300             | 338TTA025M     | 0.1105                        | 1700  | 16x31          |
| 25   | 4700             | 478TTA025M     | 0.0847                        | 2190  | 16x41          |
| 25   | 6800             | 688TTA025M     | 0.0683                        | 2480  | 18x41          |
| 25   | 10000            | 109TTA025M     | 0.063                         | 3240  | 22x51          |
| 25   | 15000            | 159TTA025M     | 0.0486                        | 3700  | 22x50          |
| 35   | 10               | 106TTA035M     | 23.2101                       | 41  | 5x13           |
| 35   | 22               | 226TTA035M     | 10.55                         | 70  | 5x13           |
| 35   | 68               | 686TTA035M     | 3.4132                        | 200   | 8x16           |
| 35   | 100              | 107TTA035M     | 2.231                         | 200   | 8x16           |
| 35   | 150              | 157TTA035M     | 1.5473                        | 270   | 8x20           |
| 35   | 220              | 227TTA035M     | 1.055                         | 340   | 8x20           |
| 35   | 470              | 477TTA035M     | 0.4938                        | 640   | 10x26          |
| 35   | 1000             | 108TTA035M     | 0.2321                        | 980   | 13x26          |
| 35   | 1500             | 158TTA035M     | 0.1768                        | 1280  | 16x31          |
| 35   | 2200             | 228TTA035M     | 0.1356                        | 1580  | 16x31          |
| 35   | 3300             | 338TTA035M     | 0.0904                        | 1810  | 16x41          |
| 35   | 4700             | 478TTA035M     | 0.0705                        | 2470  | 22x41          |
| 35   | 6800             | 688TTA035M     | 0.0634                        | 2760  | 22x51          |
| 35   | 10000            | 109TTA035M     | 0.0531                        | 3500  | 25x51          |
| 50   | 1                | 105TTA050M     | 165.786                       | 10  | 5x13           |
| 50   | 2.2              | 225TTA050M     | 90.4289                       | 23  | 5x13           |
| 50   | 4.7              | 475TTA050M     | 42.3284                       | 36  | 5x13           |
| 50   | 10               | 106TTA050M     | 19.8944                       | 50  | 5x13           |
| 50   | 15               | 156TTA050M     | 13.2629                       | 70  | 5x13           |
| 50   | 22               | 226TTA050M     | 9.0429                        | 85  | 6.3x13         |
| 50   | 33               | 336TTA050M     | 6.0286                        | 115   | 6.3x16         |
| 50   | 47               | 476TTA050M     | 4.2328                        | 140   | 6.3x16         |
| 50   | 100              | 107TTA050M     | 1.9894                        | 220   | 8x16           |

| WVDC | Capacitance (µF) | IC PART NUMBER | Maximum ESR (Ω) 120 Hz, +20°C | Maximum RMS Ripple Current (mA) 120 Hz, +85°C | Dims DxDL (mm) |
|------|------------------|----------------|-------------------------------|---|----------------|
| 50   | 150              | 157TTA050M     | 1.3263                        | 285   | 10x16          |
| 50   | 220              | 227TTA050M     | 0.9043                        | 440   | 10x21          |
| 50   | 330              | 337TTA050M     | 0.6029                        | 565   | 10x26          |
| 50   | 470              | 477TTA050M     | 0.4233                        | 740   | 13x26          |
| 50   | 1000             | 108TTA050M     | 0.1989                        | 1130  | 16x30          |
| 50   | 1500             | 158TTA050M     | 0.1547                        | 1480  | 16x41          |
| 50   | 2200             | 228TTA050M     | 0.1206                        | 1930  | 16x41          |
| 50   | 3300             | 338TTA050M     | 0.0804                        | 2350  | 22x41          |
| 50   | 4700             | 478TTA050M     | 0.705                         | 2510  | 22x51          |
| 63   | 10               | 106TTA063M     | 16.579                        | 55  | 5x13           |
| 63   | 47               | 476TTA063M     | 3.527                         | 165   | 8x16           |
| 63   | 68               | 686TTA063M     | 2.438                         | 250   | 8x20           |
| 63   | 100              | 107TTA063M     | 1.658                         | 260   | 8x20           |
| 63   | 150              | 157TTA063M     | 1.052                         | 310   | 10x21          |
| 63   | 220              | 227TTA063M     | 0.754                         | 490   | 10x25          |
| 63   | 330              | 337TTA063M     | 0.502                         | 650   | 13x26          |
| 63   | 470              | 477TTA063M     | 0.353                         | 845   | 13x31          |
| 63   | 1000             | 108TTA063M     | 0.1658                        | 1330  | 16x31          |
| 63   | 2200             | 228TTA063M     | 0.1055                        | 2158  | 18x40          |
| 63   | 3300             | 338TTA063M     | 0.0804                        | 2370  | 22x51          |
| 63   | 4700             | 478TTA063M     | 0.0635                        | 3080  | 25x60          |
| 80   | 1000             | 108TTA080M     | 0.1658                        | 1500  | 16x41          |
| 80   | 2200             | 228TTA080M     | 0.106                         | 2260  | 22x51          |
| 100  | 0.47             | 474TTA100M     | 352.737                       | 10  | 5x13           |
| 100  | 1                | 105TTA100M     | 331.573                       | 18  | 5x13           |
| 100  | 2.2              | 225TTA100M     | 75.3575                       | 27  | 5x13           |
| 100  | 3.3              | 335TTA100M     | 50.2383                       | 34  | 5x13           |
| 100  | 4.7              | 475TTA100M     | 50.3284                       | 40  | 5x13           |
| 100  | 10               | 106TTA100M     | 16.579                        | 65  | 6.3x13         |
| 100  | 22               | 226TTA100M     | 7.536                         | 120   | 8x16           |
| 100  | 33               | 336TTA100M     | 5.0238                        | 145   | 8x16           |
| 100  | 47               | 476TTA100M     | 3.527                         | 190   | 8x20           |
| 100  | 100              | 107TTA100M     | 1.658                         | 310   | 10x26          |
| 100  | 150              | 157TTA100M     | 1.1052                        | 515   | 13x26          |
| 100  | 220              | 227TTA100M     | 0.754                         | 560   | 13x26          |
| 100  | 330              | 337TTA100M     | 0.5024                        | 730   | 13x31          |
| 100  | 470              | 477TTA100M     | 0.353                         | 960   | 16x31          |
| 100  | 1000             | 108TTA100M     | 0.1658                        | 1640  | 18x41          |
| 100  | 2200             | 228TTA100M     | 0.1055                        | 2560  | 25x51          |
| 160  | 1                | 105TTA160M     | 331.573                       | 14  | 6.3x13         |
| 160  | 2.2              | 225TTA160M     | 150.715                       | 23  | 6.3x16         |
| 160  | 3.3              | 335TTA160M     | 100.477                       | 33  | 8x16           |
| 160  | 4.7              | 475TTA160M     | 70.5474                       | 50  | 8x16           |
| 160  | 10               | 106TTA160M     | 33.157                        | 80  | 8x20           |
| 160  | 22               | 226TTA160M     | 15.072                        | 130   | 10x26          |
| 160  | 33               | 336TTA160M     | 10.048                        | 170   | 13x26          |
| 160  | 47               | 476TTA160M     | 7.055                         | 225   | 13x31          |
| 160  | 100              | 107TTA160M     | 3.316                         | 400   | 16x31          |
| 160  | 220              | 227TTA160M     | 1.507                         | 660   | 22x41          |
| 250  | 2.2              | 225TTA250M     | 150.715                       | 30  | 8x16           |
| 250  | 3.3              | 335TTA250M     | 100.477                       | 40  | 8x16           |
| 250  | 10               | 106TTA250M     | 33.157                        | 90  | 10x21          |
| 250  | 22               | 226TTA250M     | 15.072                        | 160   | 13x26          |
| 250  | 33               | 336TTA250M     | 10.048                        | 190   | 13x31          |
| 250  | 47               | 476TTA250M     | 7.055                         | 255   | 16x31          |
| 250  | 100              | 107TTA250M     | 3.316                         | 450   | 16x41          |
| 250  | 220              | 227TTA250M     | 1.507                         | 764   | 22x41          |
| 350  | 1                | 105TTA350M     | 331.573                       | 20  | 6.3x16         |

# TTA

+85°C, Standard, General Purpose, 2000 hours

| WVDC | Capacitance (µF) | IC PART NUMBER    | Maximum ESR (Ω) 120 Hz, +20°C | Maximum RMS Ripple Current (mA) 120 Hz, +85°C | Dims DxL (mm) |
|------|------------------|-------------------|-------------------------------|---|---------------|
| 350  | 2.2              | <b>225TTA350M</b> | 150.715                       | 33  | 8x16          |
| 350  | 4.7              | <b>475TTA350M</b> | 70.5474                       | 55  | 8x20          |
| 350  | 10               | <b>106TTA350M</b> | 33.157                        | 100   | 13x26         |
| 350  | 22               | <b>226TTA350M</b> | 15.072                        | 150   | 13x31         |
| 350  | 33               | <b>336TTA350M</b> | 10.048                        | 210   | 16x31.5       |
| 350  | 47               | <b>476TTA350M</b> | 7.055                         | 290   | 16x41         |
| 350  | 100              | <b>107TTA350M</b> | 3.316                         | 460   | 18x41         |
| 450  | 1                | <b>105TTA450M</b> | 414.466                       | 19  | 8x16          |
| 450  | 2.2              | <b>225TTA450M</b> | 188.394                       | 31  | 10x21         |

| WVDC | Capacitance (µF) | IC PART NUMBER      | Maximum ESR (Ω) 120 Hz, +20°C | Maximum RMS Ripple Current (mA) 120 Hz, +85°C | Dims DxL (mm) |
|------|------------------|---------------------|-------------------------------|---|---------------|
| 450  | 3.3              | <b>335TTA450M</b>   | 125.596                       | 38  | 8x20          |
| 450  | 4.7              | <b>475TTA450M</b>   | 88.184                        | 50  | 10x26         |
| 450  | 10               | <b>106TTA450M</b>   | 41.4466                       | 90  | 12.5x25       |
| 450  | 22               | <b>226TTA450M</b>   | 18.8394                       | 160   | 16x31         |
| 450  | 33               | <b>336TTA450M</b>   | 12.5596                       | 230   | 16x41         |
| 450  | 47               | <b>476TTA450MRZ</b> | 8.8184                        | 300   | 18x41         |
| 450  | 100              | <b>107TTA450M</b>   | 4.145                         | 370   | 22x51         |
| 500  | 22               | <b>226TTA500AQW</b> | 18.8394                       | 115   | 16x32         |
| 500  | 47               | <b>476TTA500ARZ</b> | 8.8184                        | 290   | 18x40         |