

## Type TYEH 105°C Series

### Key Features

- High temperature surface mount aluminum electrolytic capacitors
- 105°C temperature rating
- 1000 to 2000 hours load life assured
- Wide capacitance range
- Taped and Reeled
- 15" diameter reel size
- Designed for reflow soldering
- RoHS Compliant



TE Connectivity's vertical chip-type aluminum electrolytic capacitors are designed for surface mounting in high density PCB population.

Supplied on tape and reel for use with automatic placement equipment.

The TYEH series offers miniature case sizes with an extended temperature range (-40°C to +105°C) and voltage ratings up to 100V dc. Suitable for applications requiring reliability under more demanding conditions.

### Characteristics - Electrical

|                                    |                                    | Test Conditions<br>JIS C5101-1,-18                                                                                     |      |      |      |      |      |      |     |
|------------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|-----|
| Operating Temp. Range              | -40°C ~ +105°C                     | —                                                                                                                      |      |      |      |      |      |      |     |
| Rated Voltage                      | DC 6.3 ~ 100V                      | 105°C                                                                                                                  |      |      |      |      |      |      |     |
| Capacitance                        | 0.1 ~ 1000μF                       | 105°C                                                                                                                  |      |      |      |      |      |      |     |
| Capacitance Tolerance              | ±20%                               | 120Hz, 20°C                                                                                                            |      |      |      |      |      |      |     |
| Leakage Current                    | 0.01CV or 3μA whichever is greater | C = rated capacitance (μF)<br>V = rated DC working voltage (V)<br>Temperature = 20°C                                   |      |      |      |      |      |      |     |
| Dissipation Factor<br>(Tanδ)       | Rated Voltage                      | 6.3                                                                                                                    | 10   | 16   | 25   | 35   | 50   | 63   | 100 |
|                                    | Case L = 5.3                       | 0.3                                                                                                                    | 0.3  | 0.22 | 0.16 | 0.13 | 0.12 | -    | -   |
|                                    | Case L = 6.5~10                    |                                                                                                                        |      |      |      |      |      |      |     |
|                                    | Case dia = 6.3                     | 0.32                                                                                                                   | 0.28 | 0.24 | 0.18 | 0.15 | 0.14 | -    | -   |
|                                    | Case dia = 8~10                    | 0.3                                                                                                                    | 0.26 | 0.22 | 0.16 | 0.13 | 0.12 | 0.11 | 0.1 |
| Low Temperature<br>Characteristics | Rated Voltage                      | 6.3                                                                                                                    | 10   | 16   | 25   | 35   | 50   | 63   | 100 |
|                                    | Impedance Ratio (max)              |                                                                                                                        |      |      |      |      |      |      |     |
|                                    | Z(-25°C)/Z(+20°C)                  | 4                                                                                                                      | 3    | 2    | 2    | 2    | 2    | 2    | 2   |
|                                    | Z(-40°C)/Z(+20°C)                  | 8                                                                                                                      | 5    | 4    | 3    | 3    | 3    | 3    | 3   |
| Load Life Test<br>Case L = 5.3     | Test Time                          | 1000 Hrs                                                                                                               |      |      |      |      |      |      |     |
|                                    | Capacitance Change                 | Within ±20% of initial value                                                                                           |      |      |      |      |      |      |     |
|                                    | Dissipation Factor                 | Less than 200% of specified value                                                                                      |      |      |      |      |      |      |     |
|                                    | Leakage Current                    | Within specified value                                                                                                 |      |      |      |      |      |      |     |
|                                    |                                    | Specification satisfied when the capacitors are restored to 20°C after the rated voltage applied for 1000 hrs at 105°C |      |      |      |      |      |      |     |

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### Characteristics - Electrical (cont.)

|                                        |                     |  |                                   |     |      |               |                                                                                                                        |
|----------------------------------------|---------------------|--|-----------------------------------|-----|------|---------------|------------------------------------------------------------------------------------------------------------------------|
| Load Life Test<br>Case L = 6.5~10      | Test Time           |  | 2000 Hrs                          |     |      |               | Specification satisfied when the capacitors are restored to 20°C after the rated voltage applied for 2000 hrs at 105°C |
|                                        | Capacitance Change  |  |                                   |     |      |               |                                                                                                                        |
|                                        | 6.3V                |  | Within ±30% of initial value      |     |      |               |                                                                                                                        |
|                                        | 10~16V              |  | Within ±25% of initial value      |     |      |               |                                                                                                                        |
|                                        | 25~100V             |  | Within ±20% of initial value      |     |      |               |                                                                                                                        |
|                                        | Dissipation Factor  |  |                                   |     |      |               |                                                                                                                        |
|                                        | 6.3~16V             |  | Less than 300% of specified value |     |      |               |                                                                                                                        |
|                                        | 25~100V             |  | Less than 200% of specified value |     |      |               |                                                                                                                        |
|                                        | Leakage Current     |  | Within specified value            |     |      |               |                                                                                                                        |
| Shelf Life Test                        | Test Time           |  | 1000 hrs                          |     |      |               | Other items same as those for load life test                                                                           |
| Ripple Current & Multipliers Frequency | Frequency (Hz)      |  | 50                                | 120 | 1k   | 10k and above | —                                                                                                                      |
|                                        | Multiplier ≤16VDC   |  | 0.8                               | 1.0 | 1.15 | 1.25          |                                                                                                                        |
|                                        | Multiplier 25~35VDC |  | 0.8                               | 1.0 | 1.25 | 1.4           |                                                                                                                        |
|                                        | Multiplier 50~63VDC |  | 0.8                               | 1.0 | 1.35 | 1.5           |                                                                                                                        |
|                                        | Multiplier 100VDC   |  | 0.7                               | 1.0 | 1.35 | 1.5           |                                                                                                                        |

### Product Availability Chart

| Capacitance |      | Rated Voltage (V.DC) |           |           |           |           |           |         |         |
|-------------|------|----------------------|-----------|-----------|-----------|-----------|-----------|---------|---------|
|             |      | 6.3                  | 10        | 16        | 25        | 35        | 50        | 63      | 100     |
| μF          | Code | Dia x L              | Dia x L   | Dia x L   | Dia x L   | Dia x L   | Dia x L   | Dia x L | Dia x L |
| 0.1         | 104  |                      |           |           |           |           | 4 x 5.3   |         |         |
| 0.22        | 224  |                      |           |           |           |           | 4 x 5.3   |         |         |
| 0.33        | 334  |                      |           |           |           |           | 4 x 5.3   |         |         |
| 0.47        | 474  |                      |           |           |           |           | 4 x 5.3   |         |         |
| 1.0         | 105  |                      |           |           |           |           | 4 x 5.3   |         |         |
| 2.2         | 225  |                      |           |           |           |           | 4 x 5.3   |         |         |
| 3.3         | 335  |                      |           |           |           |           | 4 x 5.3   |         |         |
| 4.7         | 475  |                      |           |           | 4 x 5.3   | 4 x 5.3   | 5 x 5.3   |         |         |
| 10          | 106  |                      |           | 4 x 5.3   | 5 x 5.3   | 5 x 5.3   | 6.3 X 5.3 |         | 8 x 10  |
| 22          | 226  | 4 x 5.3              | 5 x 5.3   | 5 x 5.3   | 6.3 x 5.3 | 6.3 x 5.3 | 8 x 6.5   | 8 x 10  | 8 x 10  |
| 33          | 336  | 5 x 5.3              | 5 x 5.3   | 6.3 x 5.3 | 6.3 x 5.3 | 6.3 x 5.7 | 6.3 x 7.7 | 10 x 10 | 10 x 10 |
| 47          | 476  | 5 x 5.3              | 6.3 x 5.3 | 6.3 x 5.3 | 6.3 x 5.3 | 8 x 10    | 6.3 x 7.7 | 8 x 10  |         |
| 100         | 107  | 6.3 x 5.3            | 6.3 x 5.3 | 6.3 x 5.3 | 6.3 x 7.7 | 8 x 10    | 8 x 10    |         |         |
| 220         | 227  |                      | 6.3 x 7.7 | 6.3 x 7.7 | 8 x 10    | 10 x 10   | 10 x 10   |         |         |
| 330         | 337  | 8 x 10               | 8 x 10    | 8 x 10    | 10 x 10   | 10 x 10   |           |         |         |
| 470         | 477  | 8 x 10               | 8 x 10    | 8 x 10    | 10 x 10   |           |           |         |         |
| 1000        | 108  | 10 x 10              | 10 x 10   |           |           |           |           |         |         |

### Standard Product Table

| Rated Voltage V.DC | Capacitance μF | Capacitance Code | Case Size Dia x L | Case Code | Dissipation Factor (%)* | Ripple Current (mA)* | Part Number     |
|--------------------|----------------|------------------|-------------------|-----------|-------------------------|----------------------|-----------------|
| 6.3                | 22             | 226              | 4 x 5.3           | D55       | 30                      | 21                   | TYEH0J226D55MTR |
| 6.3                | 33             | 336              | 5 x 5.3           | E55       | 30                      | 30                   | TYEH0J336E55MTR |
| 6.3                | 47             | 476              | 5 x 5.3           | E55       | 30                      | 36                   | TYEH0J476E55MTR |
| 6.3                | 100            | 107              | 6.3 x 5.3         | F55       | 30                      | 61                   | TYEH0J107F55MTR |
| 6.3                | 330            | 337              | 8 x 10            | G10       | 30                      | 178                  | TYEH0J337G10MTR |
| 6.3                | 470            | 477              | 8 x 10            | G10       | 30                      | 210                  | TYEH0J477G10MTR |
| 6.3                | 1000           | 108              | 10 x 10           | H10       | 30                      | 440                  | TYEH0J108H10MTR |
| 10                 | 22             | 226              | 5 x 5.3           | E55       | 26                      | 25                   | TYEH1A226E55MTR |

## Type TYEH 105°C Series

Standard Product Table (cont.)

| Rated Voltage<br>V.DC | Capacitance<br>μF | Capacitance<br>Code | Case Size<br>Dia x L | Case<br>Code | Dissipation<br>Factor (%)* | Ripple<br>Current<br>(mA)* | Part<br>Number  |
|-----------------------|-------------------|---------------------|----------------------|--------------|----------------------------|----------------------------|-----------------|
| 10                    | 33                | 336                 | 5 x 5.3              | E55          | 26                         | 31                         | TYEH1A336E55MTR |
| 10                    | 47                | 476                 | 6.3 x 5.3            | F55          | 26                         | 43                         | TYEH1A476F55MTR |
| 10                    | 100               | 107                 | 6.3 x 5.3            | F55          | 26                         | 65                         | TYEH1A107F55MTR |
| 10                    | 100               | 107                 | 8 x 6.5              | G68          | 26                         | 110                        | TYEH1A107G68MTR |
| 10                    | 220               | 227                 | 6.3 x 7.7            | F80          | 28                         | 105                        | TYEH1A227F80MTR |
| 10                    | 220               | 227                 | 8 x 10               | G10          | 26                         | 178                        | TYEH1A227G10MTR |
| 10                    | 330               | 337                 | 8 x 10               | G10          | 26                         | 215                        | TYEH1A337G10MTR |
| 10                    | 470               | 477                 | 8 x 10               | G10          | 26                         | 250                        | TYEH1A477G10MTR |
| 10                    | 470               | 477                 | 10 x 10              | H10          | 26                         | 324                        | TYEH1A477H10MTR |
| 10                    | 1000              | 108                 | 10 x 10              | H10          | 26                         | 440                        | TYEH1A108H10MTR |
| 16                    | 10                | 106                 | 4 x 5.3              | D55          | 22                         | 16                         | TYEH1C106D55MTR |
| 16                    | 22                | 226                 | 5 x 5.3              | E55          | 22                         | 28                         | TYEH1C226E55MTR |
| 16                    | 33                | 336                 | 6.3 x 5.3            | F55          | 22                         | 40                         | TYEH1C336F55MTR |
| 16                    | 47                | 476                 | 6.3 x 5.3            | F55          | 22                         | 47                         | TYEH1C476F55MTR |
| 16                    | 100               | 107                 | 6.3 x 5.3            | F55          | 22                         | 70                         | TYEH1C107F55MTR |
| 16                    | 220               | 227                 | 6.3 x 7.7            | F80          | 24                         | 110                        | TYEH1C227F80MTR |
| 16                    | 220               | 227                 | 10 x 10              | H10          | 22                         | 324                        | TYEH1C227H10MTR |
| 16                    | 330               | 337                 | 8 x 10               | G10          | 22                         | 300                        | TYEH1C337G10MTR |
| 16                    | 330               | 337                 | 10 x 10              | H10          | 22                         | 324                        | TYEH1C337H10MTR |
| 16                    | 470               | 477                 | 8 x 10               | G10          | 22                         | 330                        | TYEH1C477G10MTR |
| 16                    | 470               | 477                 | 10 x 10              | H10          | 22                         | 324                        | TYEH1C477H10MTR |
| 25                    | 4.7               | 475                 | 4 x 5.3              | D55          | 16                         | 12                         | TYEH1E475D55MTR |
| 25                    | 10                | 106                 | 5 x 5.3              | E55          | 16                         | 21                         | TYEH1E106E55MTR |
| 25                    | 22                | 226                 | 6.3 x 5.3            | F55          | 16                         | 36                         | TYEH1E226F55MTR |
| 25                    | 33                | 336                 | 6.3 x 5.3            | F55          | 16                         | 44                         | TYEH1E336F55MTR |
| 25                    | 47                | 476                 | 6.3 x 5.3            | F55          | 16                         | 60                         | TYEH1E476F55MTR |
| 25                    | 47                | 476                 | 8 x 6.5              | G68          | 16                         | 110                        | TYEH1E476G68MTR |
| 25                    | 100               | 107                 | 6.3 x 7.7            | F80          | 18                         | 85                         | TYEH1E107F80MTR |
| 25                    | 100               | 107                 | 8 x 10               | G10          | 16                         | 178                        | TYEH1E107G10MTR |
| 25                    | 220               | 227                 | 8 x 10               | G10          | 16                         | 178                        | TYEH1E227G10MTR |
| 25                    | 220               | 227                 | 10 x 10              | H10          | 16                         | 324                        | TYEH1E227H10MTR |
| 25                    | 330               | 337                 | 10 x 10              | H10          | 16                         | 324                        | TYEH1E337H10MTR |
| 25                    | 470               | 477                 | 10 x 10              | H10          | 16                         | 350                        | TYEH1E477H10MTR |
| 35                    | 4.7               | 475                 | 4 x 5.3              | D55          | 13                         | 14                         | TYEH1V475D55MTR |
| 35                    | 10                | 106                 | 5 x 5.3              | E55          | 13                         | 23                         | TYEH1V106E55MTR |
| 35                    | 22                | 226                 | 6.3 x 5.3            | F55          | 13                         | 50                         | TYEH1V226F55MTR |
| 35                    | 33                | 336                 | 6.3 x 5.7            | F60          | 15                         | 60                         | TYEH1V336F60MTR |
| 35                    | 33                | 336                 | 8 x 6.5              | G68          | 13                         | 110                        | TYEH1V336G68MTR |
| 35                    | 47                | 476                 | 8 x 10               | G10          | 13                         | 178                        | TYEH1V476G10MTR |
| 35                    | 100               | 107                 | 8 x 10               | G10          | 13                         | 215                        | TYEH1V107G10MTR |
| 35                    | 100               | 107                 | 10 x 10              | H10          | 13                         | 324                        | TYEH1V107H10MTR |
| 35                    | 220               | 227                 | 10 x 10              | H10          | 13                         | 324                        | TYEH1V227H10MTR |
| 35                    | 330               | 337                 | 10 x 10              | H10          | 13                         | 350                        | TYEH1V337H10MTR |
| 50                    | 0.1               | 104                 | 4 x 5.3              | D55          | 12                         | 2.0                        | TYEH1H104D55MTR |
| 50                    | 0.22              | 224                 | 4 x 5.3              | D55          | 12                         | 3.0                        | TYEH1H224D55MTR |
| 50                    | 0.33              | 334                 | 4 x 5.3              | D55          | 12                         | 4.0                        | TYEH1H334D55MTR |
| 50                    | 0.47              | 474                 | 4 x 5.3              | D55          | 12                         | 5.0                        | TYEH1H474D55MTR |
| 50                    | 1.0               | 105                 | 4 x 5.3              | D55          | 12                         | 7.0                        | TYEH1H105D55MTR |
| 50                    | 2.2               | 225                 | 4 x 5.3              | D55          | 12                         | 10                         | TYEH1H225D55MTR |
| 50                    | 3.3               | 335                 | 4 x 5.3              | D55          | 12                         | 12                         | TYEH1H335D55MTR |
| 50                    | 4.7               | 475                 | 5 x 5.3              | E55          | 12                         | 17                         | TYEH1H475E55MTR |
| 50                    | 10                | 106                 | 6.3 X 5.3            | F55          | 12                         | 26                         | TYEH1H106F55MTR |
| 50                    | 22                | 226                 | 8 x 6.5              | G68          | 12                         | 65                         | TYEH1H226G68MTR |
| 50                    | 33                | 336                 | 6.3 x 7.7            | F80          | 14                         | 60                         | TYEH1H336F80MTR |
| 50                    | 33                | 336                 | 8 x 10               | G10          | 12                         | 99                         | TYEH1H336G10MTR |

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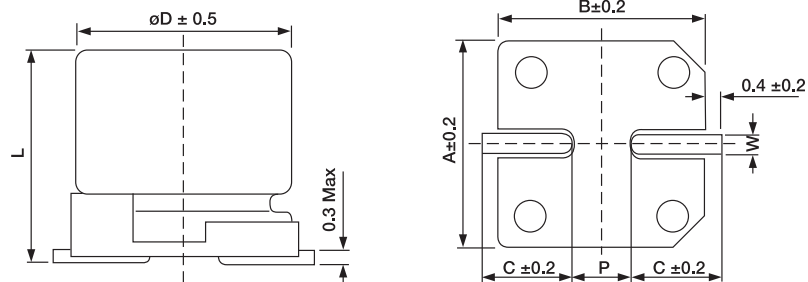
Standard Product Table (cont.)

| Rated Voltage<br>V.DC | Capacitance<br>$\mu$ F | Capacitance<br>Code | Case Size<br>Dia x L | Case<br>Code | Dissipation<br>Factor (%) <sup>*</sup> | Ripple<br>Current (mA) <sup>*</sup> | Part<br>Number  |
|-----------------------|------------------------|---------------------|----------------------|--------------|----------------------------------------|-------------------------------------|-----------------|
| 50                    | 47                     | 476                 | 6.3 x 7.7            | F80          | 14                                     | 70                                  | TYEH1H476F80MTR |
| 50                    | 47                     | 476                 | 8 x 10               | G10          | 12                                     | 99                                  | TYEH1H476G10MTR |
| 50                    | 100                    | 107                 | 8 x 10               | G10          | 12                                     | 135                                 | TYEH1H107G10MTR |
| 50                    | 100                    | 107                 | 10 x 10              | H10          | 12                                     | 160                                 | TYEH1H107H10MTR |
| 50                    | 220                    | 227                 | 10 x 10              | H10          | 12                                     | 210                                 | TYEH1H227H10MTR |
| 63                    | 22                     | 226                 | 8 x 10               | G10          | 11                                     | 99                                  | TYEH1J226G10MTR |
| 63                    | 33                     | 336                 | 10 x 10              | H10          | 11                                     | 160                                 | TYEH1J336H10MTR |
| 63                    | 47                     | 476                 | 8 x 10               | G10          | 11                                     | 140                                 | TYEH1J476G10MTR |
| 63                    | 47                     | 476                 | 10 x 10              | H10          | 11                                     | 160                                 | TYEH1J476H10MTR |
| 100                   | 10                     | 106                 | 8 x 10               | G10          | 10                                     | 67                                  | TYEH2A106G10MTR |
| 100                   | 22                     | 226                 | 8 x 10               | G10          | 10                                     | 100                                 | TYEH2A226G10MTR |
| 100                   | 22                     | 226                 | 10 x 10              | H10          | 10                                     | 133                                 | TYEH2A226H10MTR |
| 100                   | 33                     | 336                 | 10 x 10              | H10          | 10                                     | 150                                 | TYEH2A336H10MTR |

<sup>\*</sup> DF measured at 120Hz, 20°C

<sup>\*</sup> RC measured at 120Hz, 105°C

### Dimensions



| Case<br>Code | Dimensions (mm) |         |      |      |     |            |       |
|--------------|-----------------|---------|------|------|-----|------------|-------|
|              | Dia             | L       | A    | B    | C   | W          | P±0.2 |
| D55          | 4.0             | 5.3±0.3 | 4.3  | 4.3  | 2.0 | 0.5 to 0.8 | 1.0   |
| E55          | 5.0             | 5.3±0.3 | 5.3  | 5.3  | 2.3 | 0.5 to 0.8 | 1.5   |
| F55          | 6.3             | 5.3±0.3 | 6.6  | 6.6  | 2.7 | 0.5 to 0.8 | 2.0   |
| F80          | 6.3             | 7.7±0.3 | 6.6  | 6.6  | 2.7 | 0.5 to 0.8 | 2.0   |
| G68          | 8.0             | 6.5±0.3 | 8.4  | 8.4  | 3.4 | 0.5 to 0.8 | 2.3   |
| G10          | 8.0             | 10±0.5  | 8.4  | 8.4  | 3.0 | 0.7 to 1.1 | 3.1   |
| H10          | 10              | 10±0.5  | 10.4 | 10.4 | 3.3 | 0.7 to 1.1 | 4.7   |

### How to Order

| TYEH        | 0J                                                                                             | 226         | D55       | M         | TR                                                                                                                |
|-------------|------------------------------------------------------------------------------------------------|-------------|-----------|-----------|-------------------------------------------------------------------------------------------------------------------|
| Common Part | Voltage Code                                                                                   | Capacitance | Case Code | Tolerance | Packaging                                                                                                         |
| TYEH        | 0J (6.3V)<br>1A (10V)<br>1C (16V)<br>1E (25V)<br>1V (35V)<br>1H (50V)<br>1J (63V)<br>2A (100V) | e.g. 226    | e.g. D55  | M (20%)   | TR = 15" Reels<br>D55 Case - 2000 pcs<br>E55,F55, F80 and<br>G68 Case - 1000 pcs<br>G10 and H10<br>Case - 500 pcs |

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